T3C

User's Manual

TATRAMED

TomoCon Communication Center

Version 14

All patient names used in this manual are fictitious.

Table of Contents

1 Introduction

1.1 Intended use

TomoCon Communication Center (thereinafter **T3C**) is a system for patient image data transfer between medical facilities over the Internet.

Basic features of the system include:

- no specialized hardware required
- secure and reliable transfer using an ordinary Internet service
- traceability and history of transfers
- usability, various levels of automation and adjustment
- simplification of remote cooperation between medical facilities and physicians
- support for DICOM devices, PACS, TomoCon PACS and TomoCon Workstation

System allows sending images of all RDG and NM modalities, Structured Reports, and other DICOM data. It is possible to attach any file, e.g. documents, presentations, which will be sent with images. System supports sending between PACS systems, TomoCon Workstations, and TomoCon Workstation and PACS system.

System provides management of communication and guarantees that the transferred data will not be removed from the T3C Server before the recipient successfully downloads and decodes the data. It is possible to resume the downloading from or uploading to the Server, i.e. when a temporary interruption of network connectivity occurs, the process of downloading or uploading is resumed and continues as before the break. In case of short-term network break, the communication is resumed automatically, without the need of user interaction. Transferred images and attachments are automatically compressed lossless, saving up to 50 % of data.

Transfer is protected by asymmetric encryption, which means that only the recipient can decrypt the data. Because of this, the patient information cannot be read by third party, even in case of communication eavesdropping, monitoring or breaking into the T3C Server. Digital signatures are used to sign the transferred data and only trusted and known data can be downloaded. It is impossible to forge the data or pretend to be someone else. Server keeps track of trusted and known clients, and only they are authorized to use the Server.

The following features of the system also make remote cooperation between medical facilities and physicians easier. Text messages are a quick way to get in contact. Short notes for recipients make navigation among downloaded images easier. Images can be asked to be sent by digitally signed requests. The requests contain entries, which are directly used while searching images in PACS, DICOM devices or

TomoCon Workstation. Invoices for examinations can be based on reports of past image transfer records with patient and examination details.

1.2 Use cases

Institution is a general term within the scope of T3C. Any work place provided with one software T3C Service installation is represented as one *institution* e.g. an entire medical care facility, or a workstation of a single radiologist.

Example 1: The entire medical care facility uses one software T3C Service installed on a computer accessible to the whole facility. Multiple software T3C Consoles from computers of the whole facility send and receive images using the T3C Service. All employees of this medical care facility are externally represented as a single *institution*.

Example 2: The radiologist working individually at home has software T3C Console along with software T3C Service installed on his computer. This kind of radiologist home workstation is represented as a single *institution*.

Example 3: T3C also allows sending and receiving images among *institutions*, which are not connected to the same T3C Server. T3C Service sends images to the T3C Server, which it is connected to. If a recipient is connected to the different T3C Server, the sender's T3C Server automatically passes the images to the recipient's T3C Server. The images are available for download there. The recipient's T3C Service can download the images in the same way as images sent from senders connected to the same T3C Server.

1.3 Components

T3C system comprises the following three cooperating software components:

- T3C Server
- software T3C Service
- software T3C Console

T3C Server (thereinafter "Server") manages mutual communication among all *institutions* within the T3C. Server maintains the database of authorized *institutions*. Only the data transfer of authorized *institutions* is permitted. Server stores a record for each *institution* with its public key in order to verify digital signatures. Server receives data sent to recipient *institution*'s separate box. Solely recipient *institution* can download the data. Each *institution* checks its box and is able to download data without delay while Server is receiving data or after the data is completely received. Transferred data can be removed from recipient's box by the recipient manually or automatically by Server if expiration period elapses.

T3C Service (thereinafter "Service") is a software process providing data transfer between its *institution* and Server. Service is responsible for compression, encryption

and digital signature of the data, also controls the data transfer to Server. On the recipient's side, Service controls the download of available data from Server, then decrypts and decompresses the data. Service can be protected behind any firewall, which allows only outgoing HTTP connections. Service is installed on client workstation or on shared server for entire *institution*.

T3C Console (thereinafter "Console") is software user environment to control Service, prepare outgoing studies for Service and store studies received by Service. Console provides sending of patient image documentation – studies from:

- DICOM device (e.g. PACS),
- TomoCon Workstation,
- any local disk or network folder.

Similarly, received studies can be stored to any of these options.

1.4 Data transfer overview

Console allows a user to send and receive studies in the following mode of operation:

Sending studies

1. The sender uses Console for selecting studies to send from:
   - DICOM device (e.g. PACS),
   - TomoCon Workstation,
   - any local disk or network folder.

   Attachments can be enclosed with each study.
2. Console prepares the studies in Service automatically.
3. The studies are automatically compressed, encrypted and digitally signed on Service.
4. Service sends the studies to Server into recipient's box. Server verifies digital signatures.

Note: The Sending Wizard guides a user through the process of sending studies (details in the chapter 4.1.1 Sending study).

Receiving studies

1. Recipient's Service periodically checks recipient's box on Server and automatically downloads available studies.
2. During the download digital signature verification, decryption and decompression are performed.

3. Console allows the user to store downloaded studies to:
    - DICOM device (e.g. PACS),
    - TomoCon Workstation,
    - any local disk or network folder.

   Attachments enclosed with studies can be opened or copied. For details on storing studies refer to chapter 4.1.2 Storing study.

2 Installation

2.1 Hardware and software requirements

T3C system does not require specialized hardware. It runs on Microsoft Windows operating system in version that is officially supported by Microsoft Corporation. Currently, these are Microsoft Windows 10 and 11.

Note: Service in extensive use should be run on appropriate hardware for optimal performance. Please consult our customer support for optimizing performance according to your needs (see contact details 5 Contact).

2.2 Installation

Launch the installation wizard (**T3CSetup**) and install all components at the first installation. At the end of the first installation, the registration activation wizard is automatically launched (details in the chapter 4.1.11 Institution registration activation).

The installation creates "TomoCon Communication Center" group in Windows Start menu containing a shortcut to launch the application.

For updating the installed application or installing missing components, also launch the installation wizard. The *institution* registration activation is skipped in this case (see the chapter 2.3 Update).

2.3 Update

To update the installed applications, launch the installation wizard (**T3CSetup**). Select components to be upgraded and replaced with the newer version. If you are installing missing components, selecting only the missing ones will suffice. As your *institution* has already been activated, the installation wizard ends without starting the registration activation.

2.4 Uninstallation

The uninstallation can be launched from Control Panel or the Windows operating system Start menu group "TomoCon Communication Center" using the **Uninstal** shortcut.

3 T3C Console

3.1 Main window

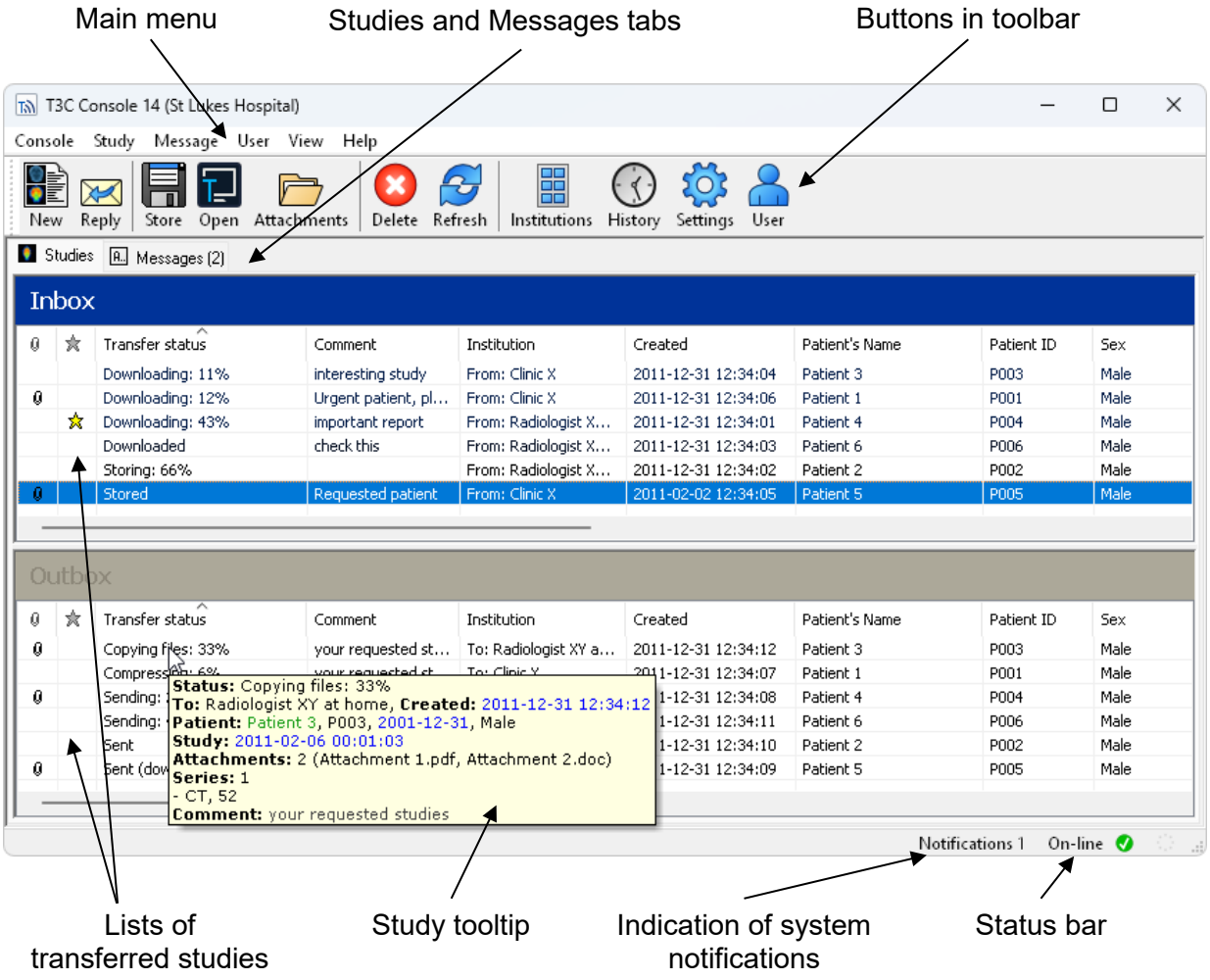

Figure 1 – T3C Console main window

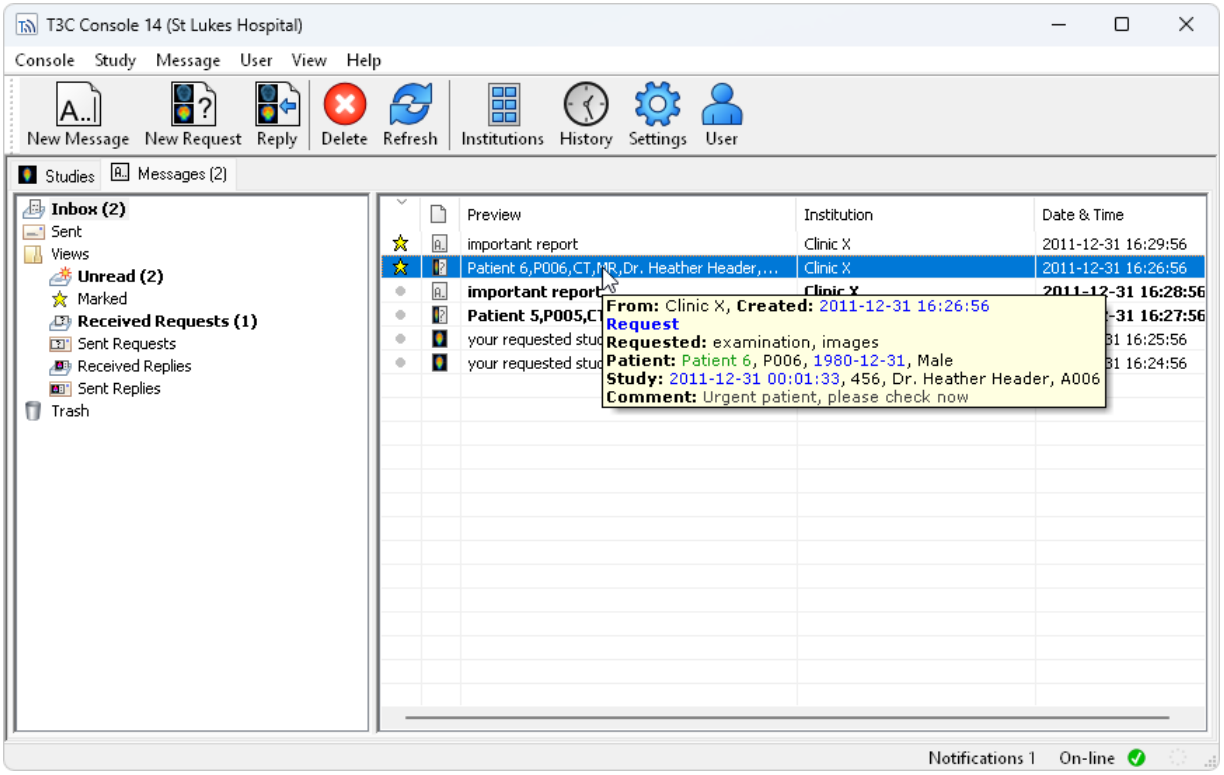

Figure 2 – T3C Console main window: tab Messages

3.2 Buttons

The toolbar buttons allow quick access to Console tools. The toolbar offers buttons that are relevant to an active tab, either Studies or Messages (see below). The following buttons are always available in the toolbar.

The **Refresh** button is used for updating Inbox and Outbox lists. The lists are periodically updated from Service. Use the button or the key `F5` to update the lists. Likewise, Service is periodically updated from Server. Use the combination `Ctrl` + (click on the **Refresh** button while holding the `Ctrl` key) or the keyboard shortcut `Ctrl` + `F5` to update Service from Server.

Warning: Server response to your update request may not be instantaneous. It depends on the current network load and your connection speed.

The **Institutions** button opens the list of all *institutions* registered on Server.

The **History** button opens the History Records window in which you can keep track of past transfers and related events (details in the chapter 3.7 History Records).

The **Setup** button opens the window containing all settings (details in the chapter 3.9 Settings).

The **User** button opens the window containing user settings (details in the chapter 3.5.2 User settings).

3.2.1 Study buttons

The **New** button opens the Sending Wizard window, which guides you through study sending process (see instructions in the chapter 4.1.1 Sending study).

The **Reply** button opens the Reply Wizard, which makes sending medical findings in reply easier (see instructions in the chapter 4.1.5 Reply study).

The **Store** button opens Storing Wizard, which allows you to choose, where you want to store selected downloaded studies (see instructions in the chapter 4.1.2 Storing study).

The **Open** button can be used for opening downloaded studies in TomoCon Workstation if installed or in TomoCon Lite if licensed.

The **Attachments** button can be used for opening attachment folders of selected stored studies with enclosed attachments.

The **Delete** button deletes selected studies. In case of deleting studies, which are currently being transferred, the data transfer is also canceled. If studies are deleted and not stored, the studies will be no longer available (see the chapter 4.1.6 Deleting study).

3.2.2 Message buttons

The **New Message** button opens a window to send a short text message (see instructions in the chapter 4.1.7 Sending text messages).

The **New Request** button opens a window to send a request for an examination or images (see instructions in the chapter 4.1.8 Sending requests).

The **Reply** button can be used for replying to received requests for examinations or images (see instructions in the chapter 4.1.9 Replying to requests).

The **Delete** button moves selected messages to the Trash folder. When you delete the messages from the Trash folder, they are permanently removed.

3.3 Studies

The tab Studies consist of the transferred studies lists Inbox and Outbox. Each list row shows Transfer status of one study, study details, Comment and the distant Institution.

Priority studies are marked with stars. To assign priority, right-click a study and select Priority in the context menu.

Each Outbox row shows one study, which you are sending. The recipient is shown in the Institution column. The sending progress is indicated by the Transfer status column:

1. Preparing files
2. Copying files
3. Compressing
4. Sending
5. Sent

Information about the recipient's progress is included in the Transfer status "Sent":

1. Sent (available for recipient)
2. Sent (downloaded by recipient)
3. Sent (stored by recipient)
4. Sent (deleted by recipient)

Studies from a DICOM device (e.g. PACS), TomoCon Workstation or any folder are copied to Service. Service handles their *sending* to Server, where they are *available* to the recipient.

Tip: Use double-clicks on the Inbox or Outbox header to expand or shrink its list. Keyboard shortcuts are also available: `Ctrl` + `1` (show Outbox), `Ctrl` + `2` (show Inbox), `Ctrl` + `~` (show both). If you press the same shortcut twice, the previous window arrangement will be restored.

Each Inbox row shows one study that has been sent to you. The sender is shown in the Institution column. The receiving progress is indicated by the Transfer status column:

1. Downloading
2. Decompressing
3. Downloaded
4. Storing
5. Stored

Service automatically downloads studies one by one in order as they become available on Server. However priority studies are transferred first. The Transfer status "Downloading % (waiting)" indicates that the sender is sending at a lower speed than the speed of the download. Downloaded studies can be *stored* to a DICOM device (e.g. PACS), TomoCon Workstation or any folder.

3.3.1 Study transfer status

Study Transfer status is displayed in one column of the Inbox and Outbox list. Transfer status follows the order of individual steps when sending or receiving studies (see the chapter 1.4 Data transfer overview). Transfer status indicates an ongoing study transfer and the completed part of the transfer.

Sending a study:

Preparing files	Preparing DICOM files from a DICOM device (e.g. PACS), TomoCon Workstation, or gathering information about files selected from a folder.
Copying files %	Console is copying files to Service. This Transfer status is displayed with a percentage value indicating progress.
Compressing %	Service compresses, encrypts and digitally signs the study. This places requirements on hardware performance. This Transfer status is displayed with a percentage value indicating progress.
Sending %	The study is being sent from Service onto Server. Server verifies the digital signature. This Transfer status is displayed with a percentage value indicating transferred amount of the study.
Sent	The study is on Server in the recipient *institution*'s box. This Transfer status is displayed, when the study transfer indicated by the previous Transfer status is completed.
Sent (available for recipient)	Recipient's Service has acquired information that the study is available in institution's box on Server.
Sent (downloaded by recipient)	The recipient has successfully downloaded the study from Server to Service.
Sent (stored by recipient)	The recipient stored the study successfully at least once.
Sent (deleted by recipient)	The recipient deleted the study from Inbox.

Receiving a study:

Downloading %	The study is being downloaded from Server to Service. Service verifies digital signatures. This Transfer status is displayed with a percentage value indicating transferred amount of the study.
Downloading % (waiting)	The sender is sending at a lower speed than the speed of the download.
Decompressing %	Service decrypts and decompresses the study. This places requirements on hardware performance.
Downloaded	The study has been downloaded to Service and is automatically removed from Server.
Storing %	The study is being stored to a DICOM device (e.g. PACS), TomoCon Workstation or any folder. This Transfer status is displayed with a percentage value indicating progress.
Stored	The study is stored. This Transfer status is displayed, when storing of the study indicated by the previous Transfer status is completed.

Unsuccessful sending:

Sending (canceled by recipient)	The recipient deleted the study before it could be sent.
Failed to prepare files	If you selected files from a local disk or a network folder, they should not be modified during the preparation. Other causes include inaccessible files, full disk and disk errors. Please consult your computer administrator.
Failed to prepare for sending	Possible causes include invalid configuration, full disk and disk errors. Please consult your computer administrator.
Error (duplicated study)	The same study has already been sent to the recipient within 24 hours. This is a safety precaution. If you insist on resubmitting the study, please change the comment.
Failed to send	The study was not sent. Please contact the administrator of T3C Server.

Unsuccessful receiving:

Failed to download	The study cannot be downloaded due to invalid digital signatures. Please ask the sender to send the study again.
Canceled by sender	The sender deleted the study before it could be sent. Therefore it could not be downloaded.
Failed to decompress	Possible causes include invalid configuration, full disk and disk errors. Please consult your computer administrator.

3.4 Messages

The tab Messages consist of the list of messages and the left pane for selection of messages to be displayed in the list.

Each list row shows Preview of one message, the distant Institution and Date & Time. Click on icons in the first column to mark messages as starred. The context menu offers stars in more colors. Icons in the second column indicate text messages, requests, or replies to requests. Incoming and outgoing messages are also denoted by icons in joint views.

Double-click on a text message to open the window which displays the text of the message, the distant institution, date and time. (Refer to the chapter 4.1.7 Sending text messages.) Similarly, you can open requests and replies. A request and its reply are shown together in one window. The distant institution is displayed at the top of the window. Entries of the request are located beneath. A heading indicates whether it is a received or sent request, along with date and time. (Refer to the chapter 4.1.8 Sending requests.) Under a received request, there is either your reply or an empty form which allows you to reply to the request. Under a sent request, a reply is displayed when the recipient has already replied. (Refer to the chapter 4.1.9 Replying to requests.)

Select the folder Inbox from the left pane to display the list of all incoming messages which consist of received text messages, requests to which you have not replied, and replies to your requests. A number of unread messages follow the folder label Inbox.

Unread received messages in the list are highlighted in a bold typeface. They are marked as read after being opened. The states unread and read can be switched using the context menu.

Select the folder Outbox from the left pane to display the list of all outgoing messages which consist of sent text messages, your requests waiting for replies, and your replies to requests. Rows of unsent messages are highlighted in red when they have not been sent yet.

All deleted messages are found in the Trash folder. When you delete the messages from the Trash folder, they are permanently removed.

In addition, the left pane offers a choice of subset views:

Unread	Shows received messages from Inbox, which are marked as unread.
Marked	Shows messages marked as starred.
Received Requests	Shows requests to which you have not replied.
Sent Requests	Shows your requests waiting for replies.
Received Replies	Shows replies to your requests.
Sent Replies	Shows your replies to requests.

3.5 User

T3C allows personalization of the environment as well as different levels of access through user management (see chapter 3.9.2 Users).

3.5.1 Login, Logout

Currently logged-in user can be logged-out via menu **User**, **Logout**. Choose menu **User**, **Login** to login as another user.

3.5.2 User settings

This dialog allows you to change yours preferences:

- Appearance
- Change Password
- Notifications

Modified settings will be applied after pressing **Save**. Press **Cancel** to discard changes and restore previous settings.

3.5.2.1 Appearance

Console has multiple languages support. This tab allows you to choose Console application language. Toolbar buttons can be displayed with large or small icons, with or without text labels. Outbox pane can be displayed on the top.

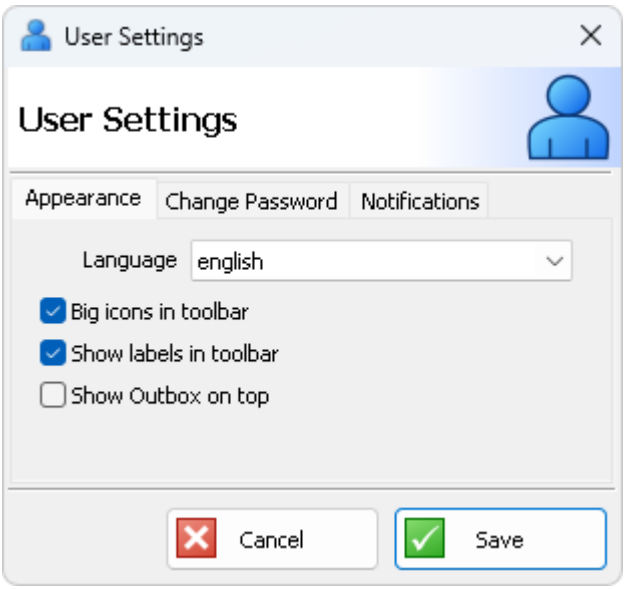

Figure 3 – User settings: Appearance tab

3.5.2.2 Change Password

This tab allows you to change your password for T3C. You have to enter the current password, a new one and confirm the new password.

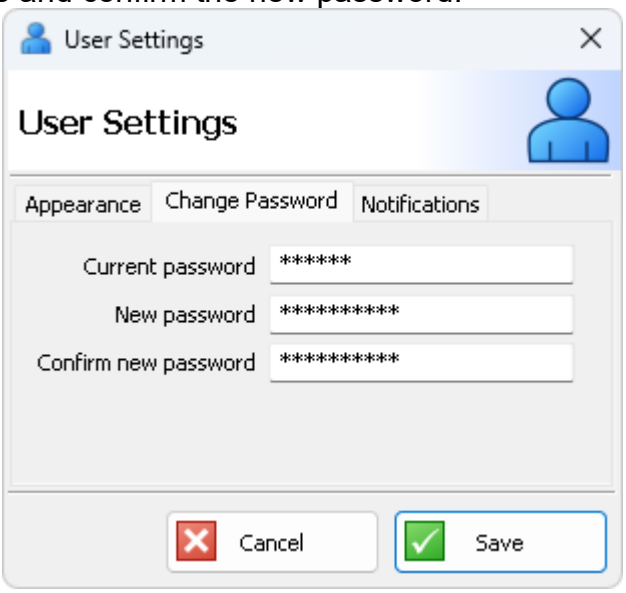

Figure 4 – User settings: Change password tab

3.5.2.3 Notifications

Console can notify user that study is downloaded, stored or sent in Windows notification area. You can turn on notifications you want.

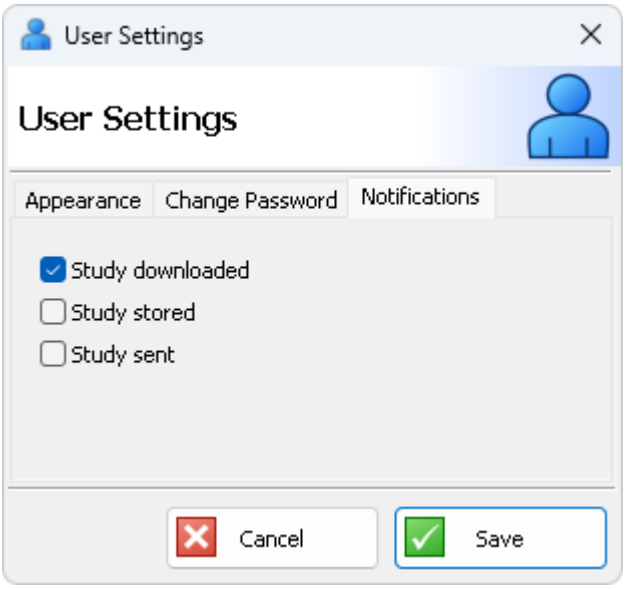

Figure 5 – User settings: Notifications tab

3.6 Institutions

Important: If you want to communicate with an institution, which is not active or present in the institution list, please contact the administrator of T3C Server.

The Institutions window can be opened using the **Institutions** toolbar button. The institution list in the middle of the window shows all *institutions* available on Server.

Tip: The **Export...** button allows you to export selected institution, selected group of institutions or a list of all institutions.

Mark your favorite institutions by clicking on a star before an institution name in the institution list. Institutions marked with yellow stars are shown as favorite institutions when choosing recipient in the step 4 of Sending Wizard (4.1.1 Sending study).

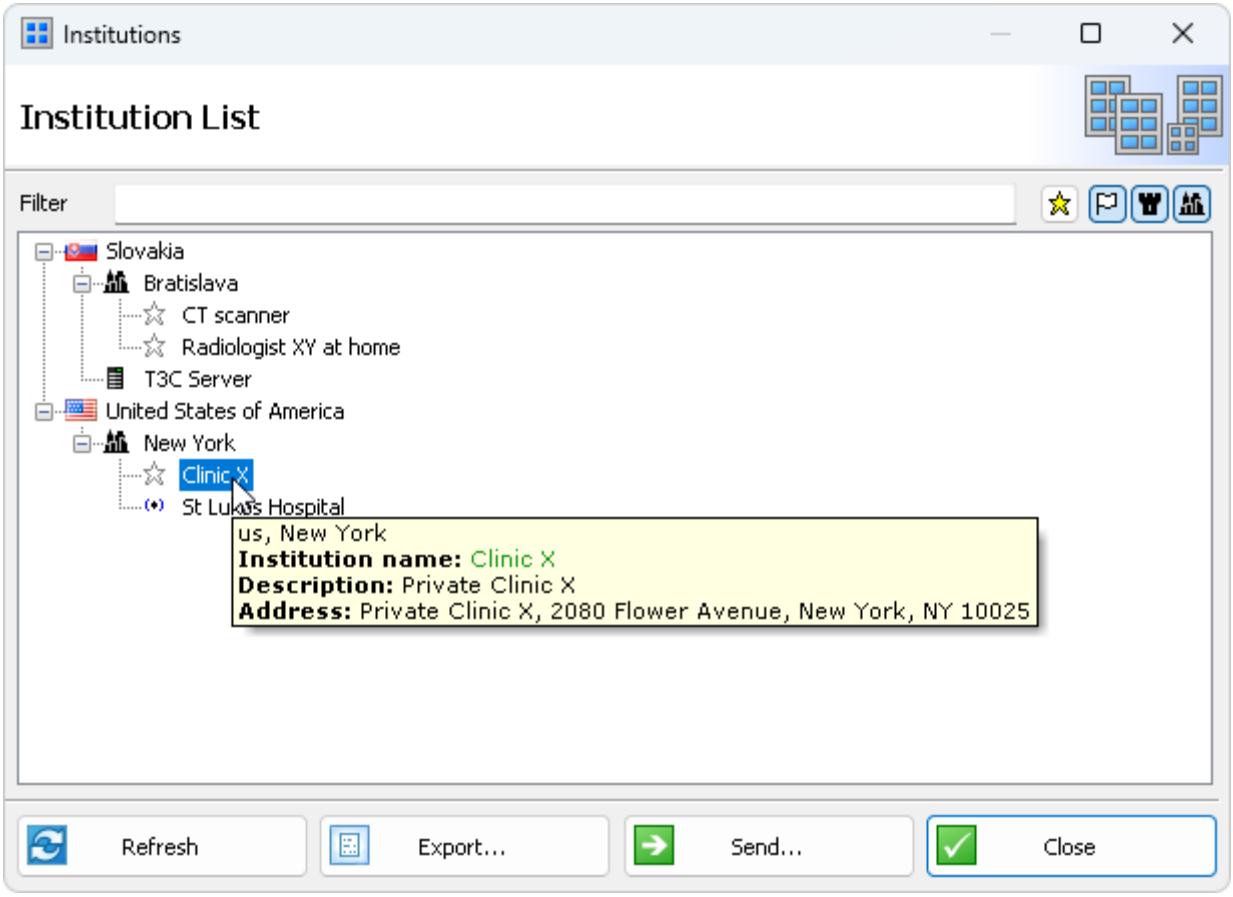

Figure 6 – Institutions

Use Filter to reduce the institution list according to a text search. Click the button ★ to show only your favorite institutions. Click the button ⚐ – country, ♜ – county or 🏙 – city to change the view by a geographic location.

3.7 History Records

Use the **History** toolbar button to open the History Records window.

The History Records window allows you to keep track of past transfers and related events. There is kept a record of patient's information, study details and events related to transfers or attached files.

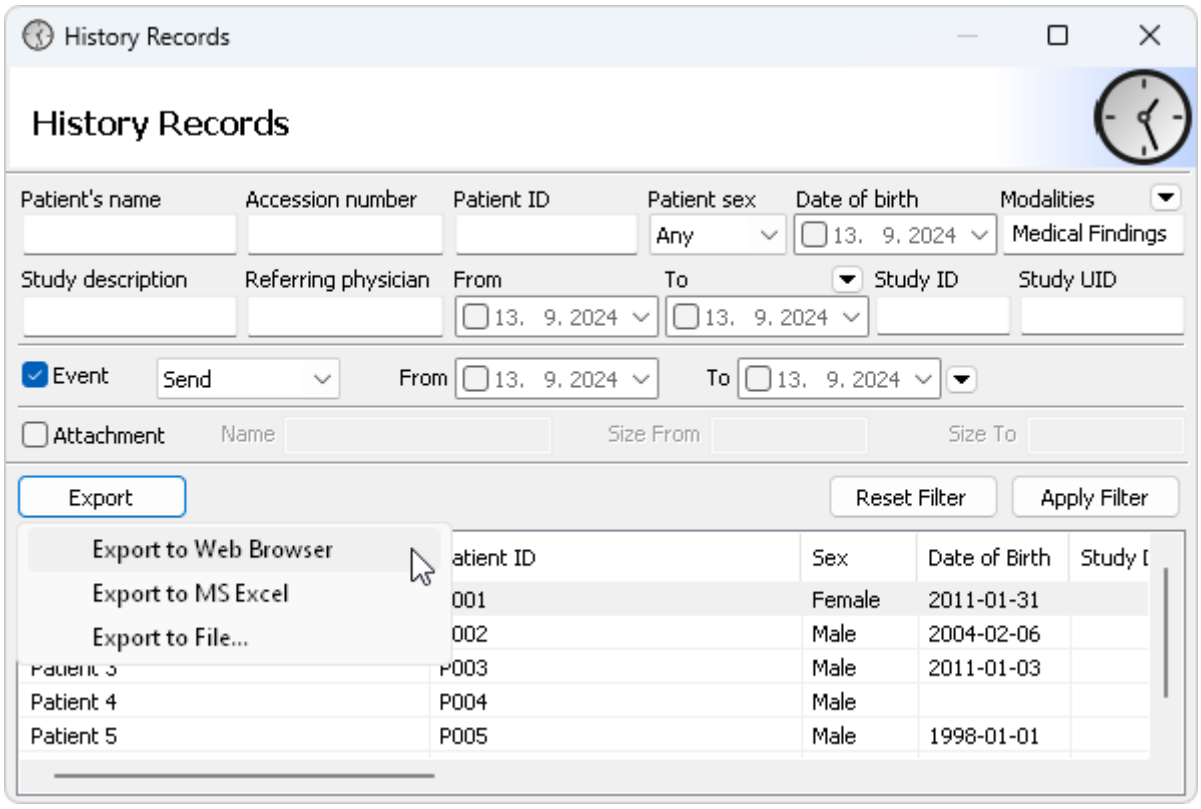

Figure 7 – History Records

Use the filtering form to search for records in which you are interested. You can specify your search criteria in the form fields separated by lines into the following three groups:

1. patient's information and study details
2. events related to transfers
3. attached files

Patient's information comprises patient's name, sex, date of birth, and patient ID.

Study details include accession number, study description, referring physician, study date, study ID or UID, and modalities.

The following events are recorded:

- New series/attachments to send
- Sent series/attachments to another institution
- Available series/attachments from another institution
- Downloaded series/attachments from/by another institution
- Stored series/attachments from/by another institution

Important: Use wildcards in the patient name field e.g.:

- "j*doe" matches either "John Doe" or "Jane Doe"
- "doe*" matches either "Doe John" or "Doe Jane"
- "*doe*" matches either "John Doe" or "Doe Jane"

Search is not case sensitive.

Press the **Apply Filter** button to retrieve history records. (Duration of history records retrieval depends on search criteria and the number of records.)

See the search results listed below the filtering form. All studies, which matched your search criteria, are listed. Click on a study to open its Study History Details.

The **Export** button allows you to export reports from history records to your web browser, MS Excel, or HTML files. Select a report from the pull-down menu on the left of the **Export** button and press the button.

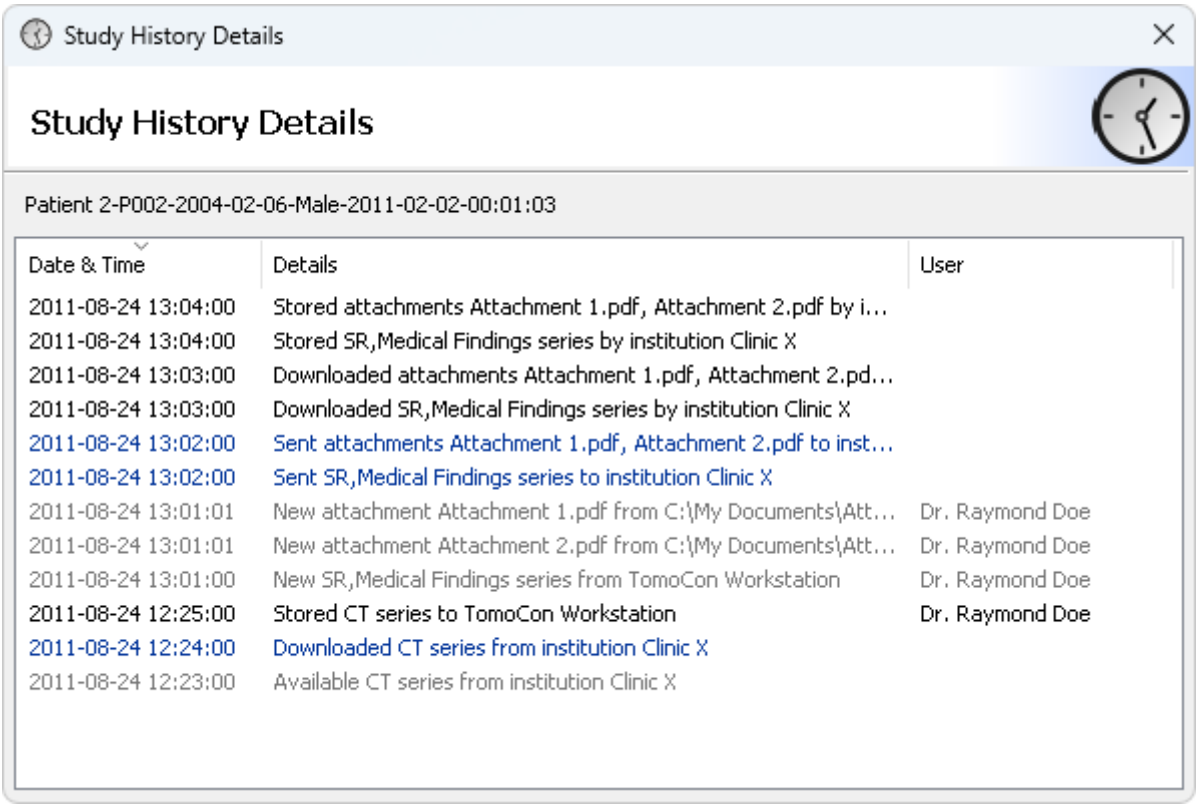

Figure 8 – Study History Details

3.8 System notifications

The application notifies the user of system events like: low disk space, too many studies or TomoCon Lite update.

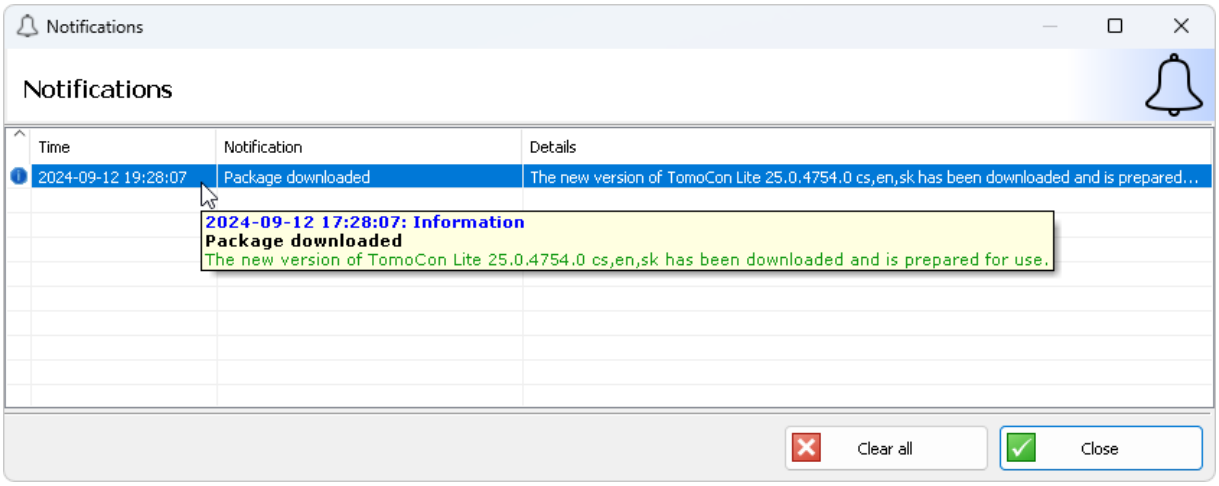

Figure 9 – The list of current system notifications

The occurrence of system notifications is indicated in the right part of the status bar.

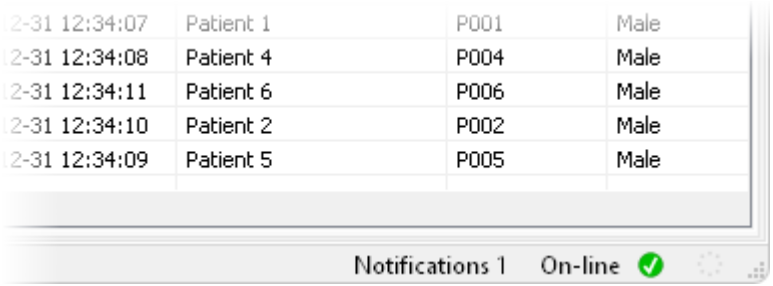

Figure 10 – Indication of system notifications

3.9 Settings

This dialog displays settings. Some settings are available only when a connection to Service is established and if authenticated user has appropriate rights. The settings are divided into the following tabs:

- System
- Users
- Notification
- Devices
- Receivers
- Sending
- Storing
- Deletion

The modified settings will be applied after pressing **Save**. Press **Cancel** to discard changes and restore previous settings.

3.9.1 System

In this tab, you can configure Service connection, Console DICOM settings and Console automation.

You can configure Service connection by specifying network address and port or automatically by using Search button if Service is currently running on local network.

To configure Console DICOM receiver, please specify AE Title and port. To configure DICOM devices used by Console, click DICOM configuration for T3C Console button.

Finally, you can choose whether all incoming studies will be automatically stored to TomoCon Workstation.

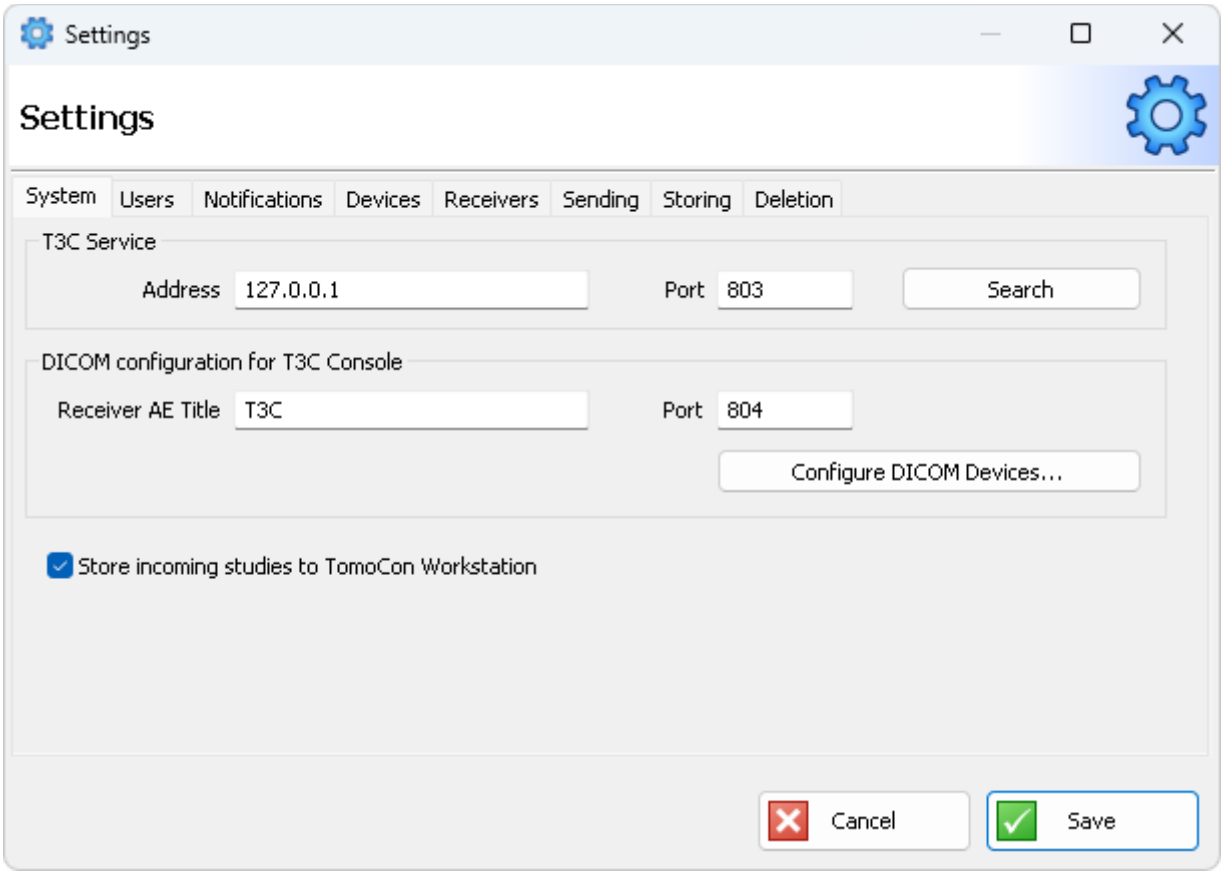

Figure 11 – DICOM devices configuration

Configure DICOM Devices settings keep the list of remote DICOM devices and PACS servers configurations. The Name field serves as a label for a simple identification of the devices in Console. The other fields (Address, Port, AE Title) are device dependent settings and should be consulted with device's administrator.

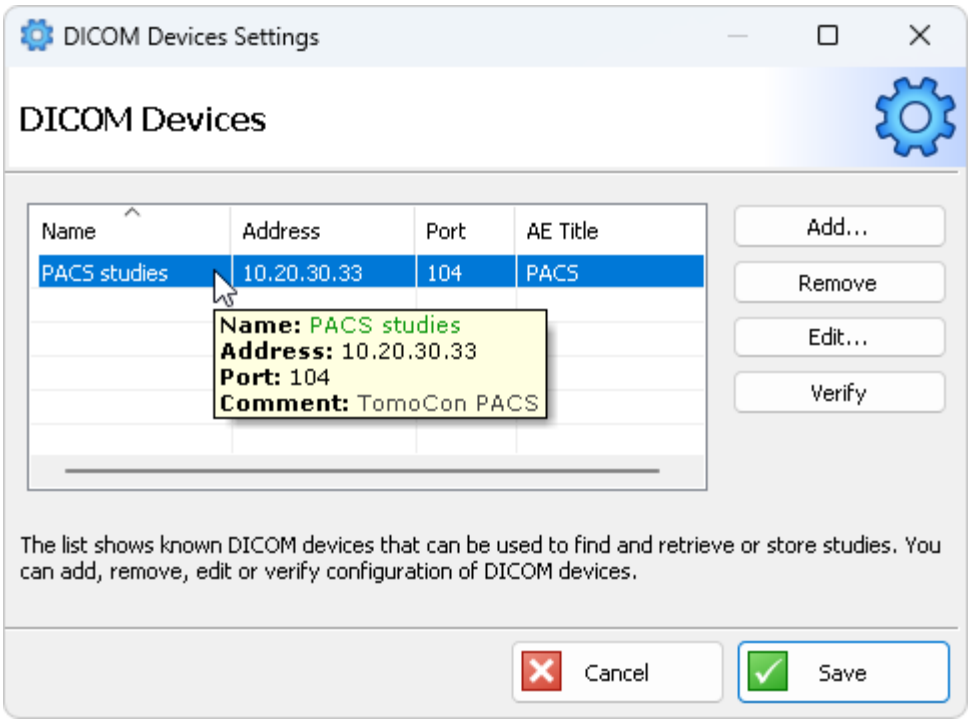

Figure 12 – DICOM device details

3.9.2 Users

The Users tab is available only if the current user has the administrator's rights. It allows you to create new users or edit user settings (in User Settings dialog) or remove users.

Tip: Users are not prompted to login if the default user with the username "default" and the password "default" is defined.

Note: The user settings change will take effect upon re-logging into Console.

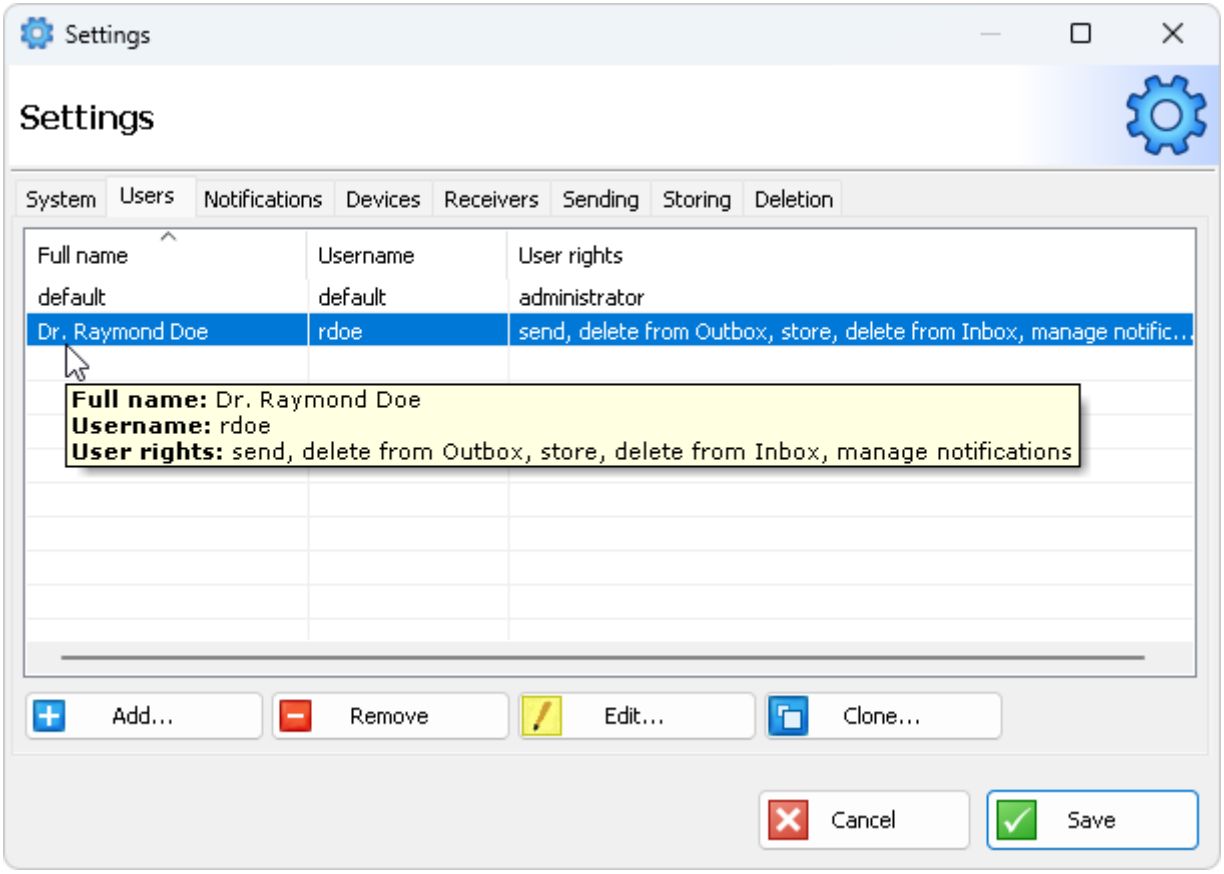

Figure 13 – Settings: Users tab

3.9.2.1 Details tab

In this tab, you can specify user details such a full name, username, password and application language.

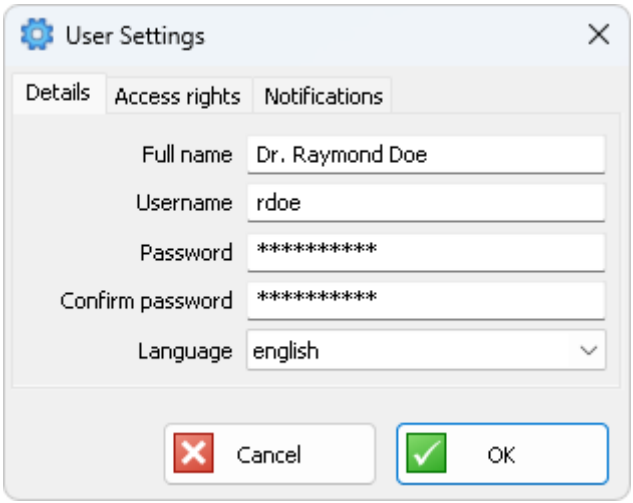

Figure 14 – User settings: Details tab

3.9.2.2 Access rights tab

In this tab, you can assign the user following access rights:

Administrator	Permits all actions including the users management and the management of notification rules for all users
Send	Permits to send studies, messages and define sending rules. Enables the toolbar buttons **New** and **Reply** and allows access to Sending tab in Service Settings.
Store	Permits to store studies and define storing rules. Enables the toolbar button **Store** and allows access to Storing tab in Service Settings.
Delete from Outbox	Permits to delete outgoing studies. Enables the toolbar button **Delete**.
Delete from Inbox	Permits to delete outgoing studies. Enables the toolbar button **Delete**.
Define notifications	Permits to edit rules for sending notifications. Allows access to Notification tab in Service Settings.
Manage devices	Permits to configure service DICOM devices and receivers. Allows access Devices and Receivers tabs in Service Settings.

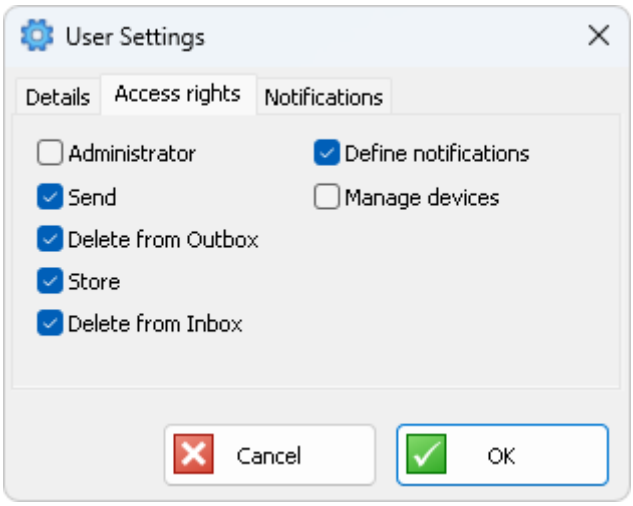

Figure 15 – User settings: Access rights tab

3.9.2.3 Notifications tab

In this tab, you can choose which notifications will Console display in Windows notification area (see the chapter 3.9.3 Notifications).

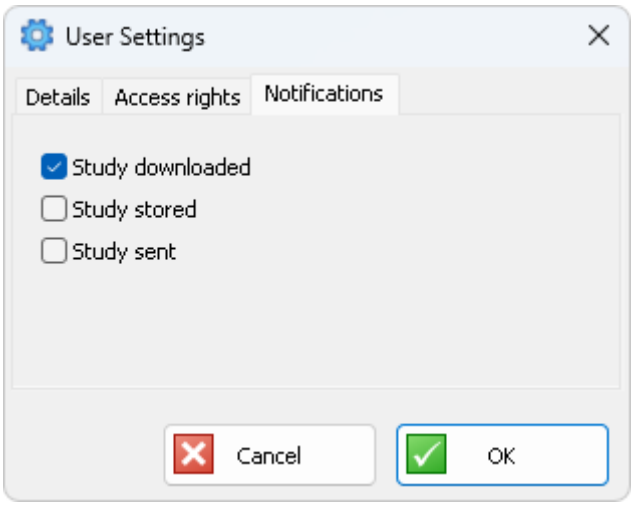

Figure 16 – User settings: Notifications tab

3.9.3 Notifications

The Notifications tab is available only if the current user has the right to define notifications. The current user can use the Notification Settings window to create new rules for sending notifications, remove or edit rules. Rules apply only to studies and messages which are accessible to a user who created the rules (refer to the chapter 3.9.2 Users). Every user has access to rules that he created.

A user, who has the administrator's rights, can also access notification rules of all users and the additional column Owner is displayed in the tab.

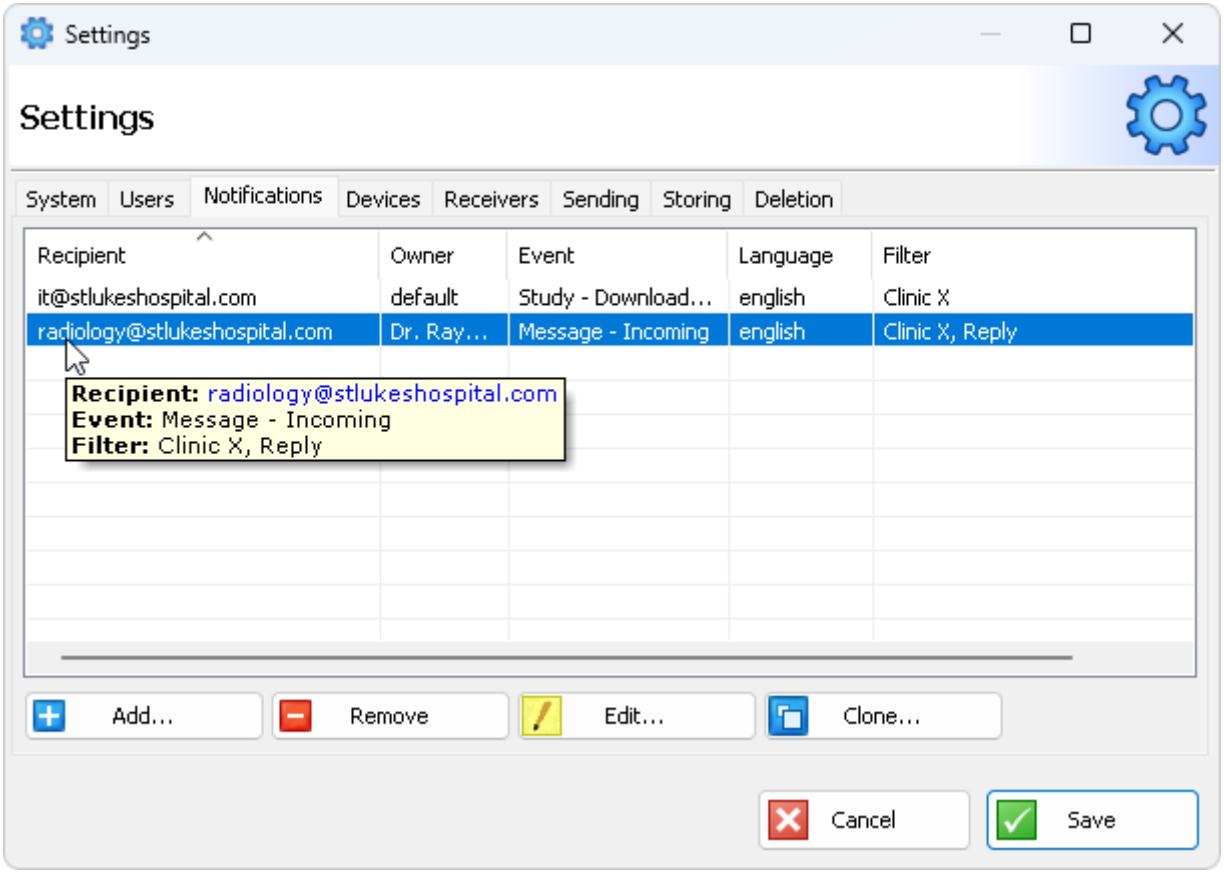

Figure 17 – Settings: Notifications tab

Notifications are sent by e-mail when a chosen event occurs. The event can be a new study transfer status or an incoming message. The notifications can indicate a new transfer status of outgoing studies (New, Sent, Available for recipient, Downloaded by recipient, Stored by recipient) as well as incoming studies (Downloaded, Stored) or the failures while processing the studies (Failed to process).

Warning: Since notifications are sent by Service, they can be sent only while Service is running.

If you fill in some of the Filter fields, notifications will be sent only for studies and messages that match your criteria. The Institution field specifies either a recipient of outgoing studies or a sender of incoming studies and messages. Study transfer notifications can be bound to specific modalities or expressions that should be included in Study Description or Comment. Message notifications can be bound to message types.

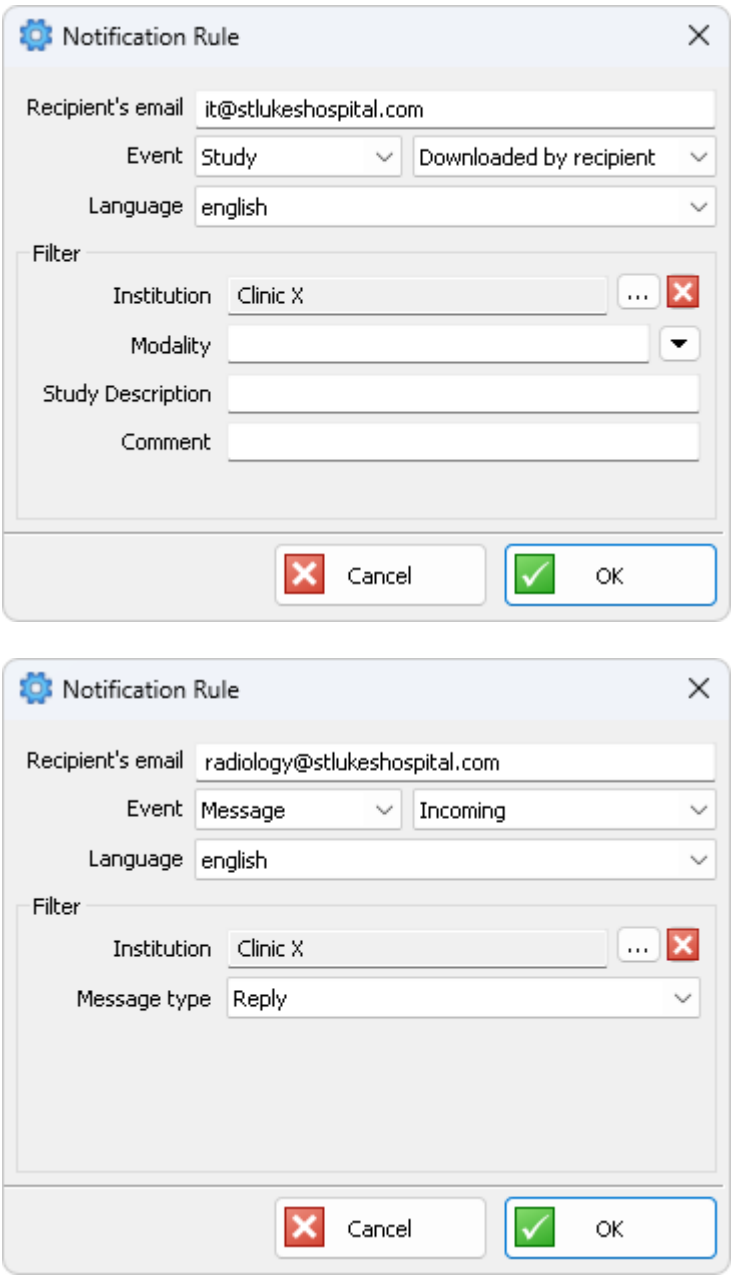

Figure 18 – Settings: A notification rule about studies/messages

3.9.4 Devices

Devices tab serves for the DICOM devices management used in automation. Common attributes of a DICOM device like name, address, AE title, port and also other advanced properties can be configured here. The tab is available if the current user has the right to manage devices.

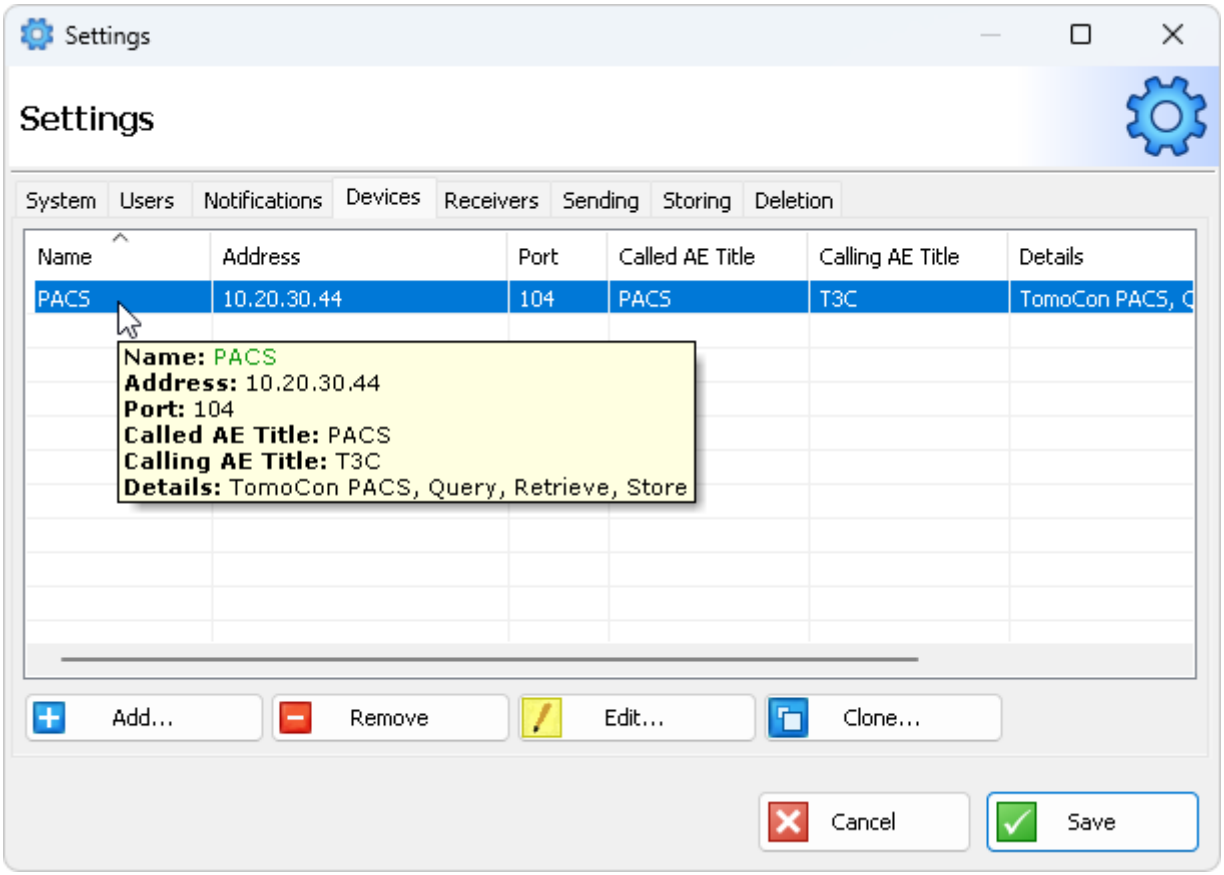

Figure 19 – Settings: Devices tab

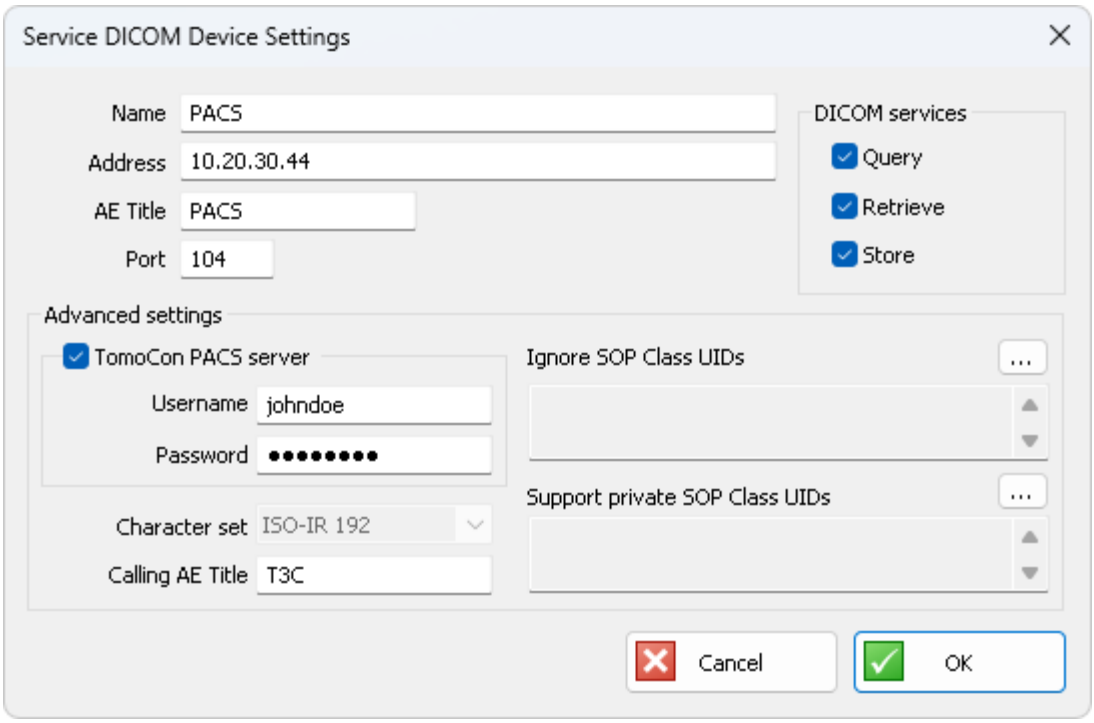

Figure 20 – Settings: Device configuration

3.9.5 Receivers

Receivers tab serves for the DICOM receivers management used in automation. The tab is available if the current user has the right to manage devices. The DICOM receiver's basic attributes like name, AE title and port can be configured here.

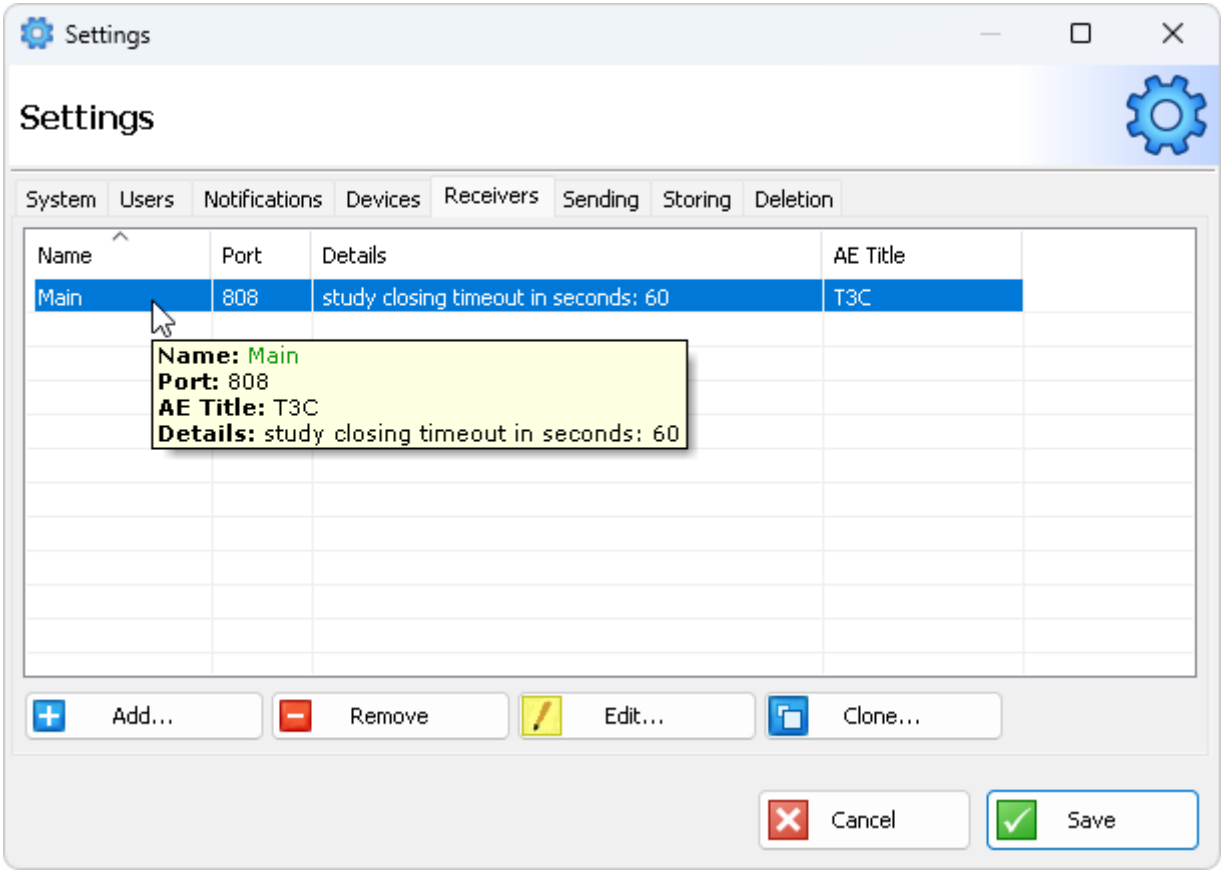

Figure 21 – Settings: Receiver tab

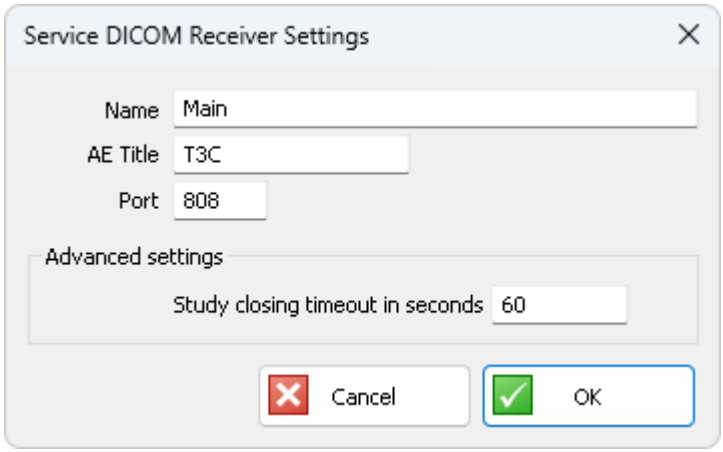

Figure 22 – Settings: Receiver configuration

Tip: Since a receiver does not know the number of study images that a device will send, to finish receiving the receiver waits certain amount of time - the study closing timeout. If no image is received during the timeout, the receiver closes the study reception and it is sent to the recipient.

3.9.6 Sending

Sending tab allows the definition of rules for automatic sending of received studies (via DICOM receiver) to the destination institution. This option is available if the current user has the right to send studies.

Incoming study is usually matched by AE Title and sent to paired institution; however, configuration allows other models of use (e.g. sending all incoming studies to one destination institution).

Moreover, it is possible to choose a transformation that will change the study before sending. The study can be automatically deleted after it is sent successfully.

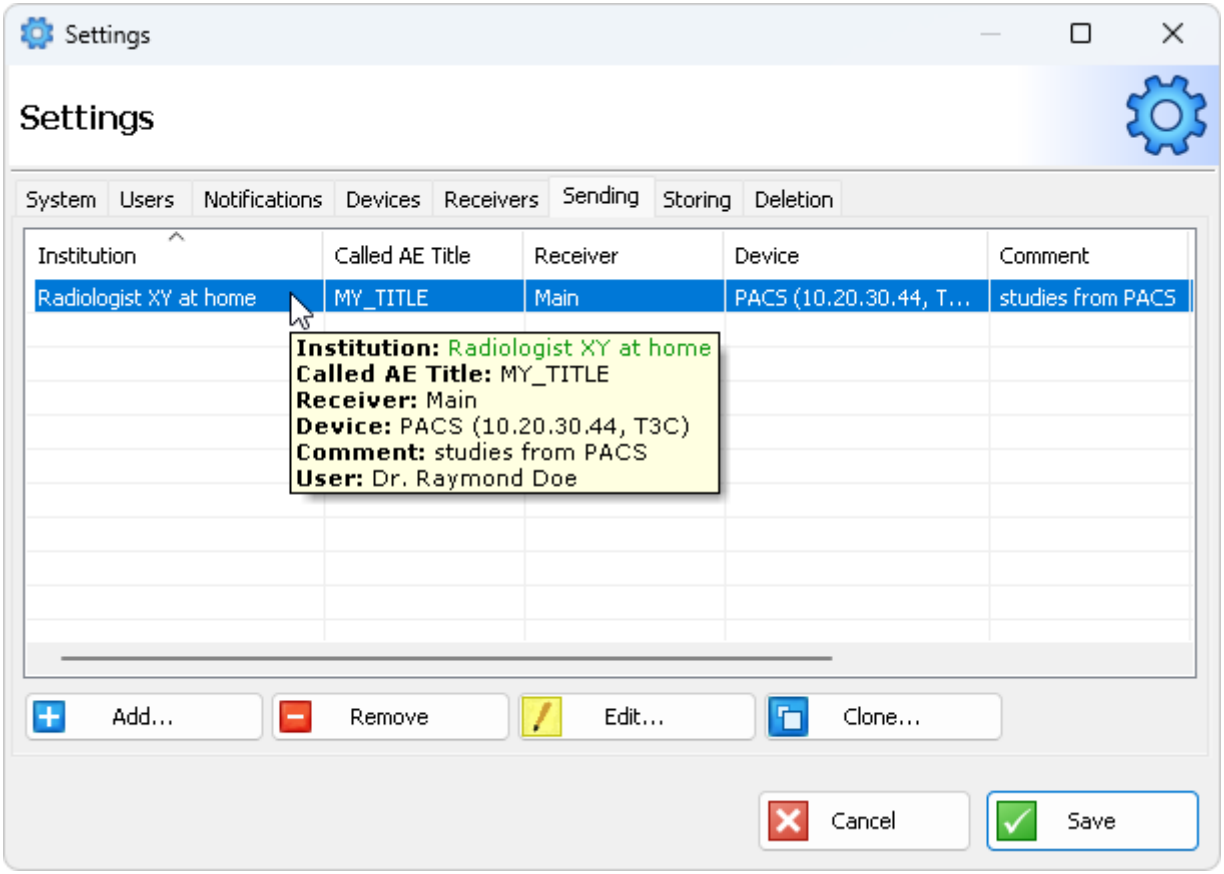

Figure 23 – Settings: Sending tab

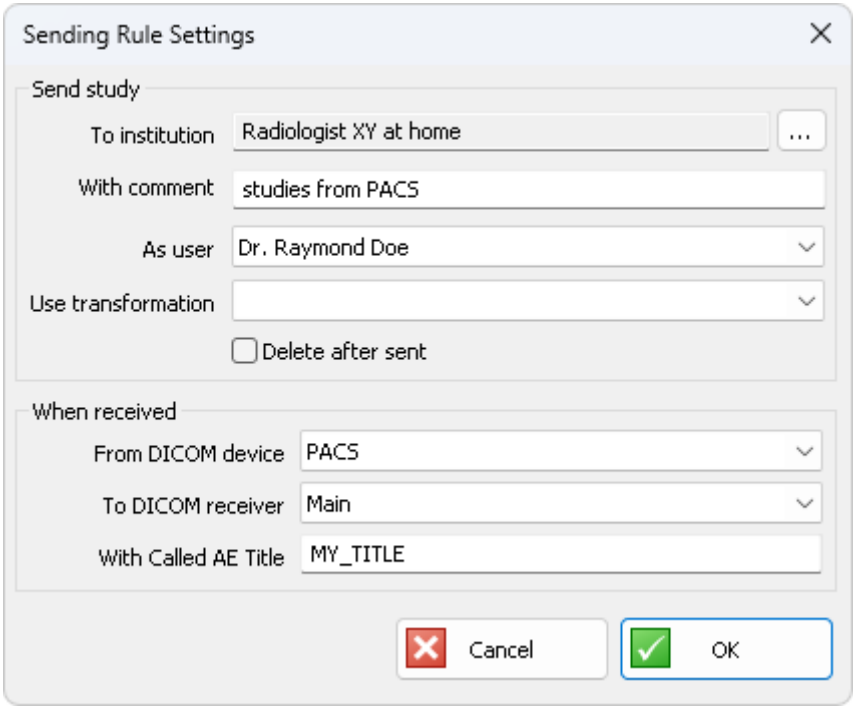

Figure 24 – Settings: Sending rule configuration

3.9.7 Storing

Storing tab allows definition of rules for automatic storing of incoming studies sent from other institution. The studies can be stored to PACS server or on the disk. The tab is available if the current user has the right to store studies.

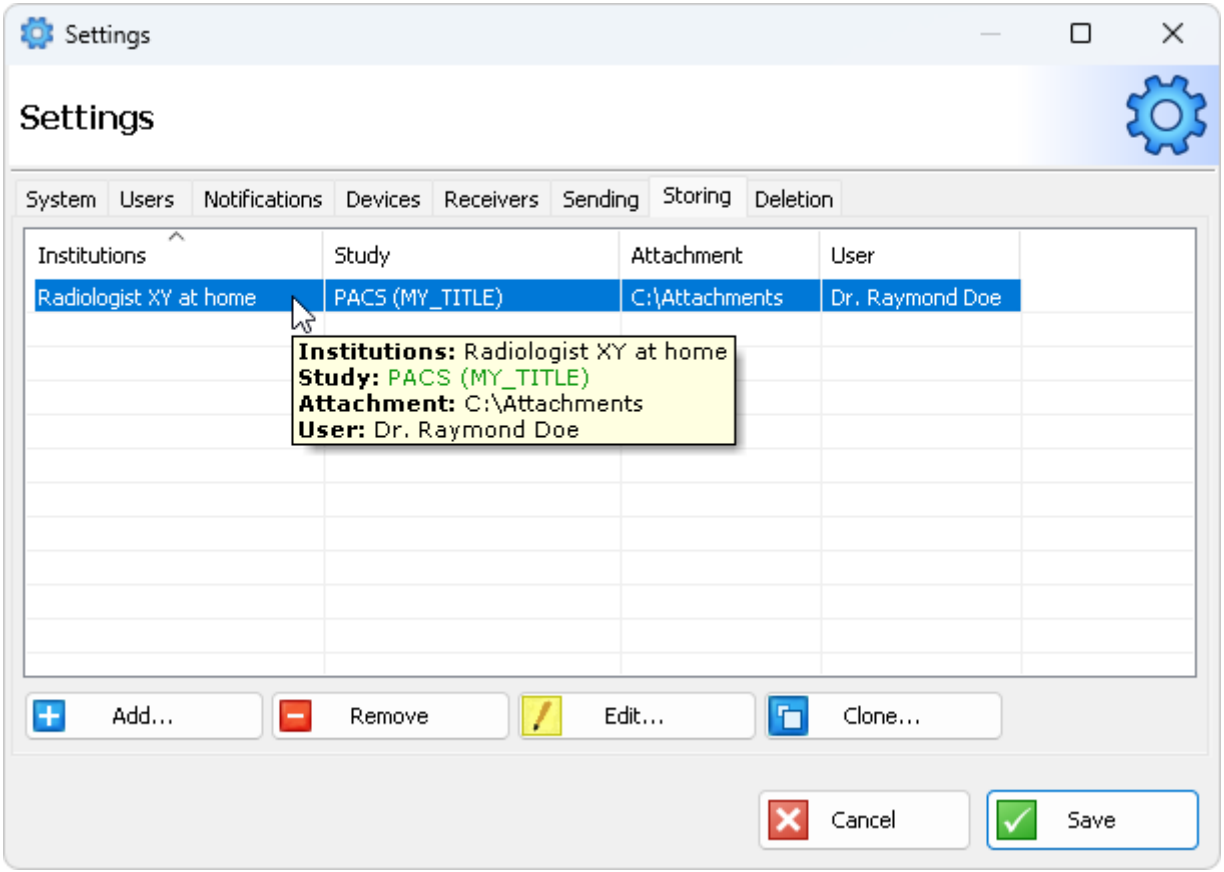

Figure 25 – Settings: Storing tab

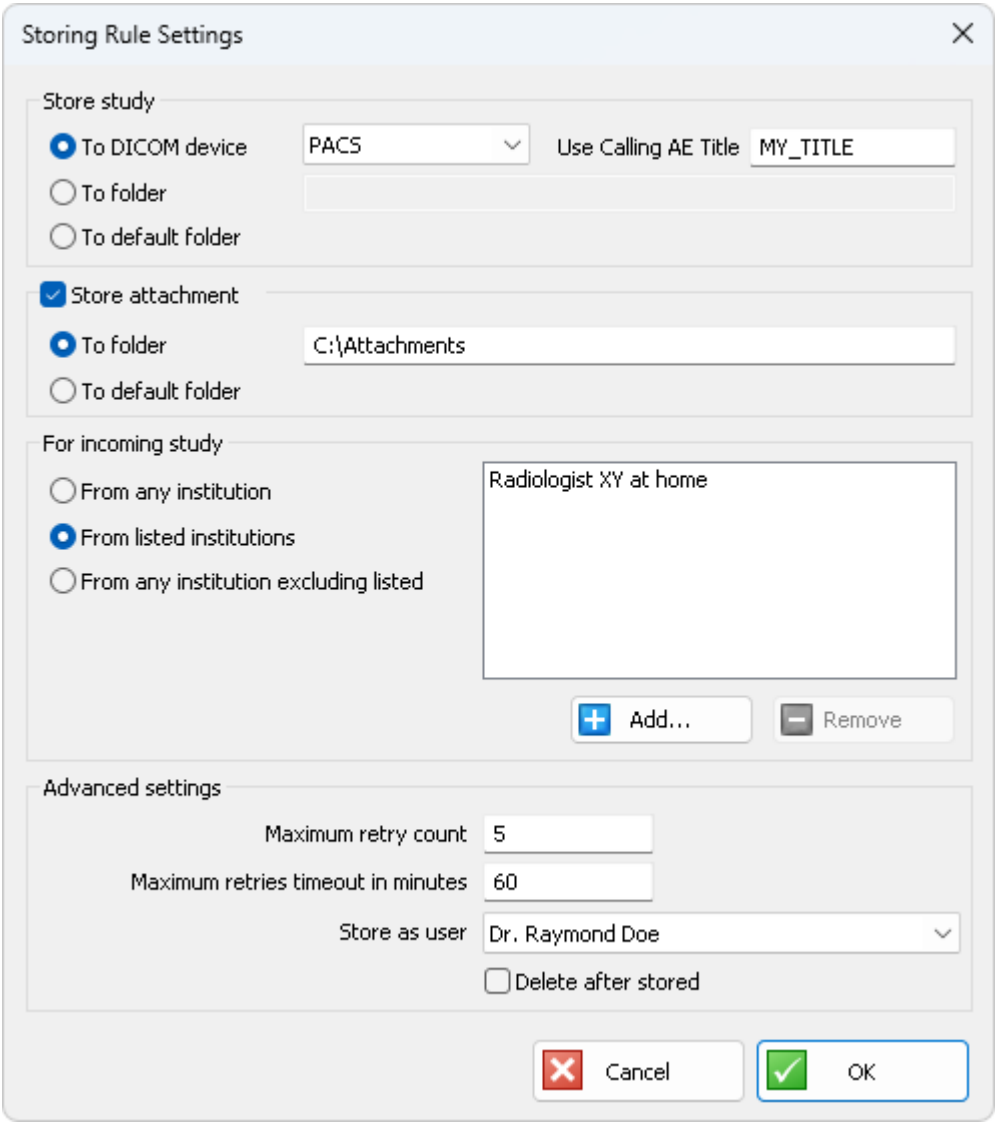

Figure 26 – Service settings: Storing rule configuration

3.9.8 Deletion

This tab is displayed only if the current user has the administration rights. Automatic deletion of incoming and outgoing studies is useful for removing closed cases from Inbox and Outbox and keeping the application responsive. After the configured time is elapsed, the sent studies are removed from Outbox and the stored studies or the studies opened in TomoCon Lite are removed from Inbox. We recommend to use at most 14 days or to fine tune the settings so that there is not usually more than 100 studies in the Inbox or Outbox.

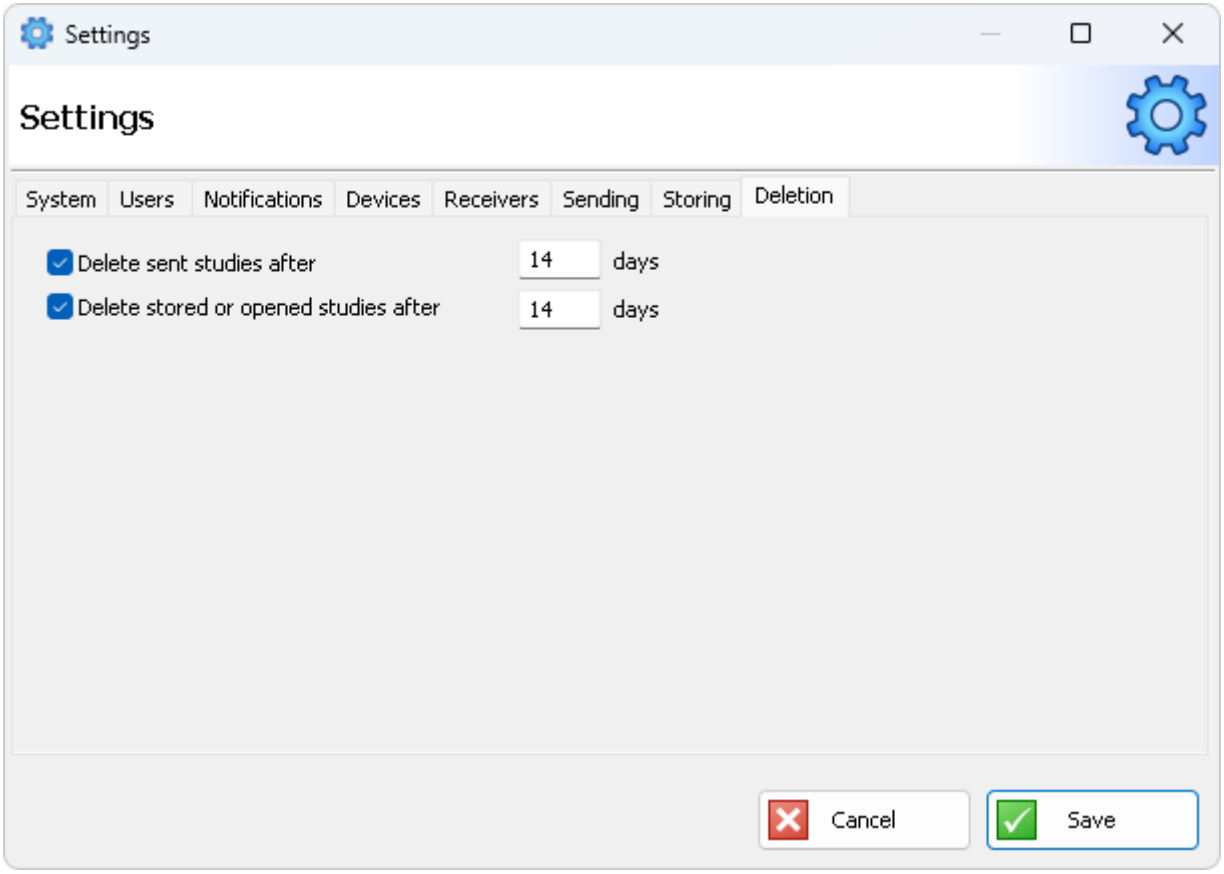

Figure 27 – Settings: Deletion tab

4 Operating procedures

4.1 Common operation

4.1.1 Sending study

Important: Let the recipient know about sent studies, if you are not in communication with the recipient or you are not sure that the recipient is actively using T3C.

Click the **New** Console button.

1. Sending Wizard will be opened. Select the source of studies, which you want to send. You can search the following sources for studies:
   a. DICOM device (e.g. PACS),
   b. TomoCon Workstation,
   c. any local disk or network folder.

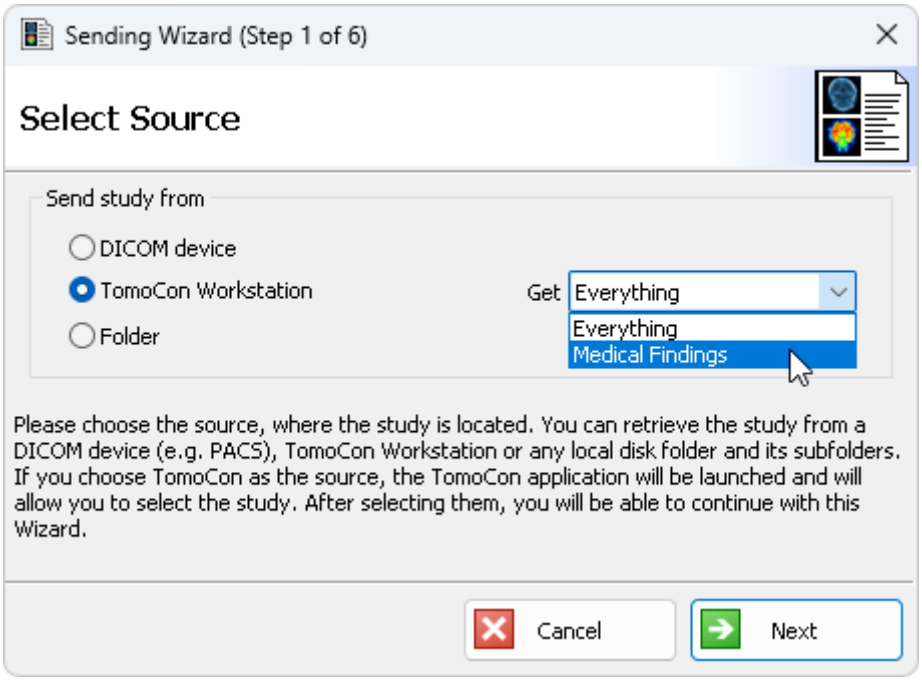

Figure 28 – Sending Wizard: select source of studies to be sent

If you intend to send only medical findings (study series containing only annotations or structured reports) while searching studies in TomoCon Workstation, select the option Medical Findings in the combo box.

Use the **Next** to follow the next step.

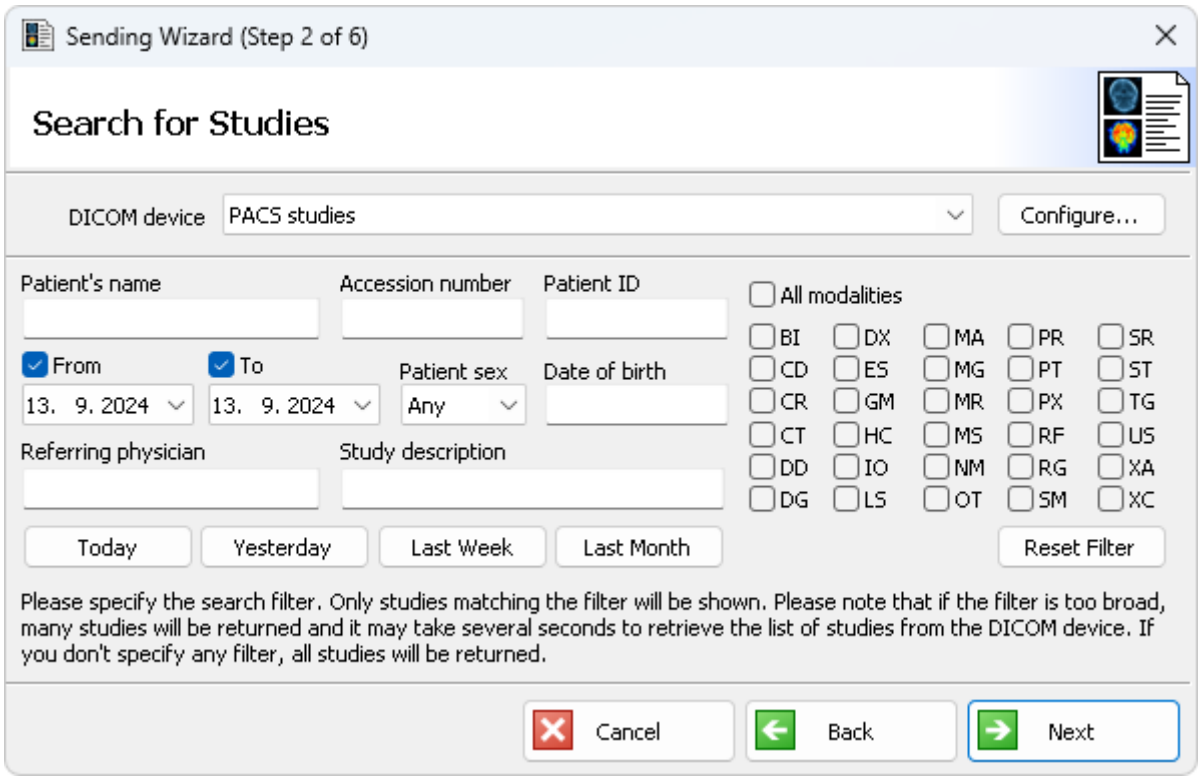

Figure 29 – Sending Wizard: searching the DICOM device for studies

2. According to your selection in step 1, proceed to the appropriate option:

2a. When searching the DICOM device (e.g. PACS) for studies, enter your searching criteria and start the search using the **Next** button.

Warning: If you do not specify any searching filter, all studies from selected DICOM device will be displayed. This is not recommended due to retrieving large amount of data from the device.

Tip: Use wildcards in the patient name field, e.g. the filter "j*doe" matches either "John Doe" or "Jane Doe". Searching is not case sensitive.

Tip: Use the "DICOM Query" format for the Date of birth:

- YYYYMMDD-YYYYMMDD
- YYYYMMDD-
- -YYYYMMDD
- YYYYMM

- YYYY

Examples:

- From the January 25th, 1970: 19700125-
- March, 1950: 195003

2b. When searching TomoCon Workstation for studies, the Search Studies window of TomoCon Workstation will be activated. Select one or more studies and press the **Select study** button. Sending Wizard will continue with the next step and allow you to send selected studies.

2c. When searching the folders for studies, select DICOM files or an entire folder to be scanned for studies. The **Add files** button lets you browse for files to be added to the list. The **Add folder** button lets you browse for folders. All files matching the specified Filter found in the chosen folder and its subfolders are added to the list. If you want to exclude files from the list, select the files and press the **Remove** button. When all your files are in the list, follow the next step (press **Next**), in which studies found in all DICOM files from the list will be displayed.

Tip: DICOM files or entire folders to be scanned for studies can be also added to the list by mouse dragging from any folder or application (e.g. Windows Explorer).

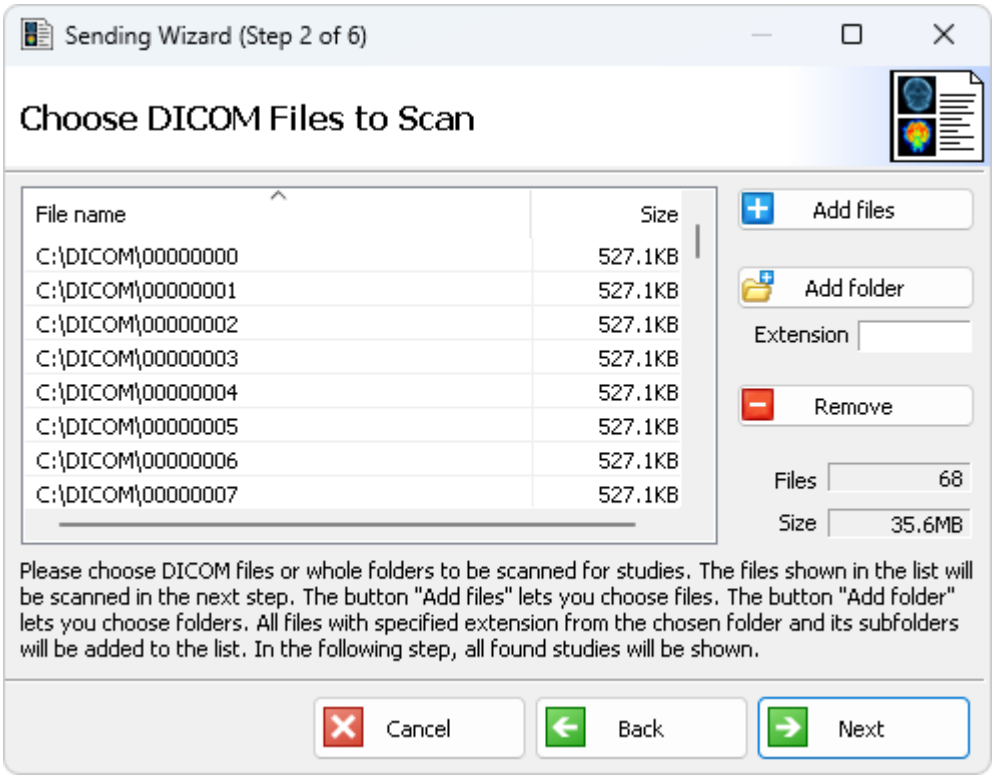

Figure 30 – Sending Wizard: scanning DICOM files for studies

3. Select studies to be sent from the list, this also allows you to choose only specific series using the **Select** button or by double-clicking the study. Double-click a study to open its series and attachments lists. The **Add files** button adds files to the attachment list in the Attachments tab. If you want to exclude files from the list, select the files and press the **Remove** button. The count and the size of all listed files are displayed below the buttons. After applying your selection of study series and attachments, changes are also indicated in the study list. The study will be marked according to your selection of all or some of the study series. If none of series and none of attachments are sent, the study is unchecked. If you enclose attachments with the study, it is also marked. Follow the next step (press **Next**).

Note: If a Patient ID field is red, it means that the study has not been provided with the correct patient ID. Patient ID check can be enabled in the Console settings tab Automation.

Note: Studies, which are also listed in Outbox or Inbox are highlighted in blue.

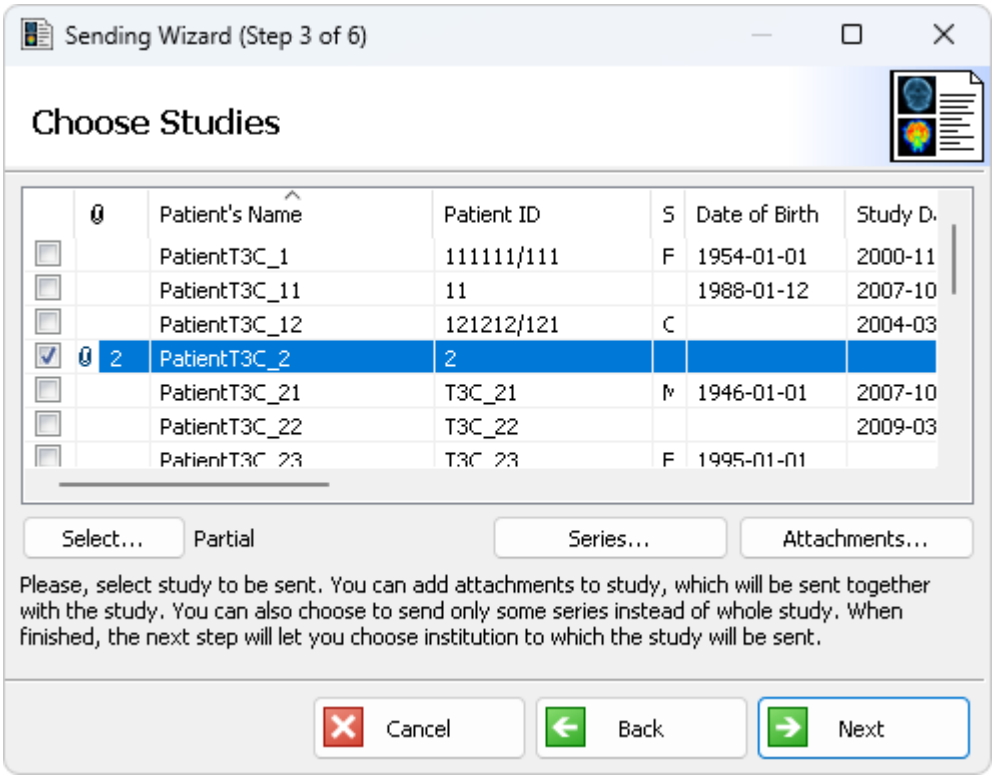

Figure 31 – Sending Wizard: choosing studies to be sent

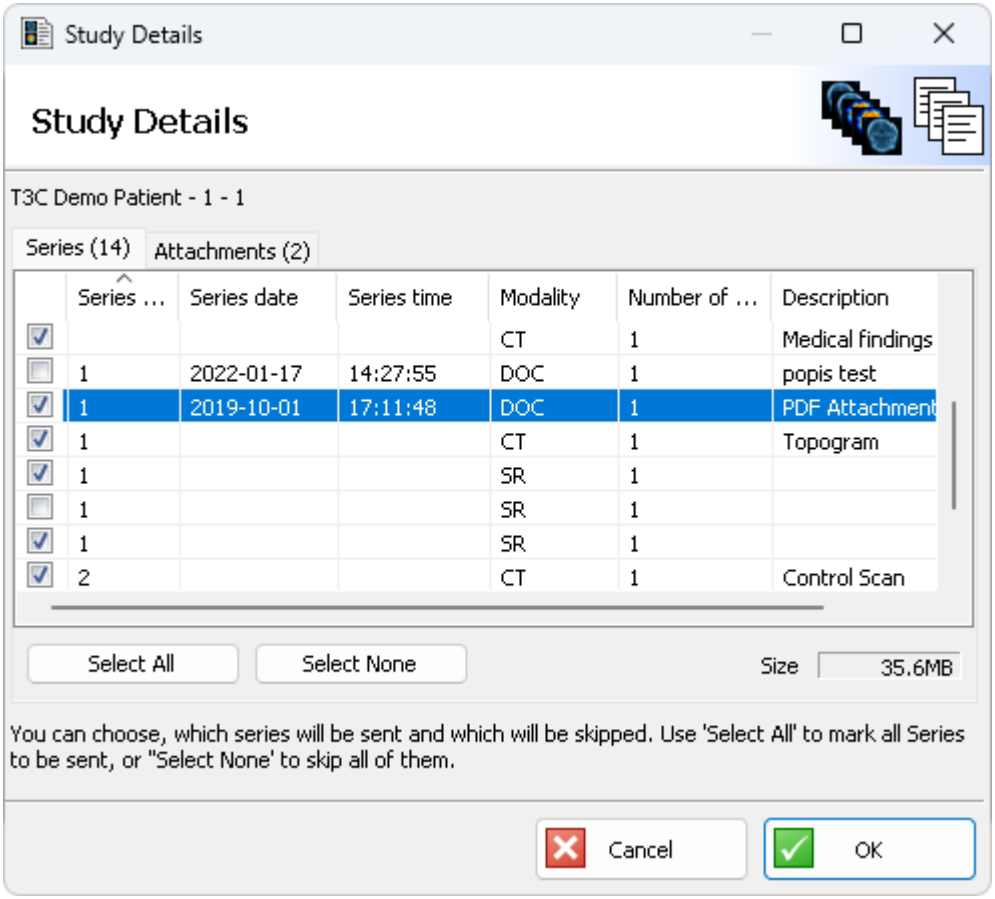

Figure 32 – Sending Wizard: choosing studies – choosing study series

Tip: Files or folders containing attachments can be also added to the attachment list by mouse dragging from any folder or application (e.g. Windows Explorer).

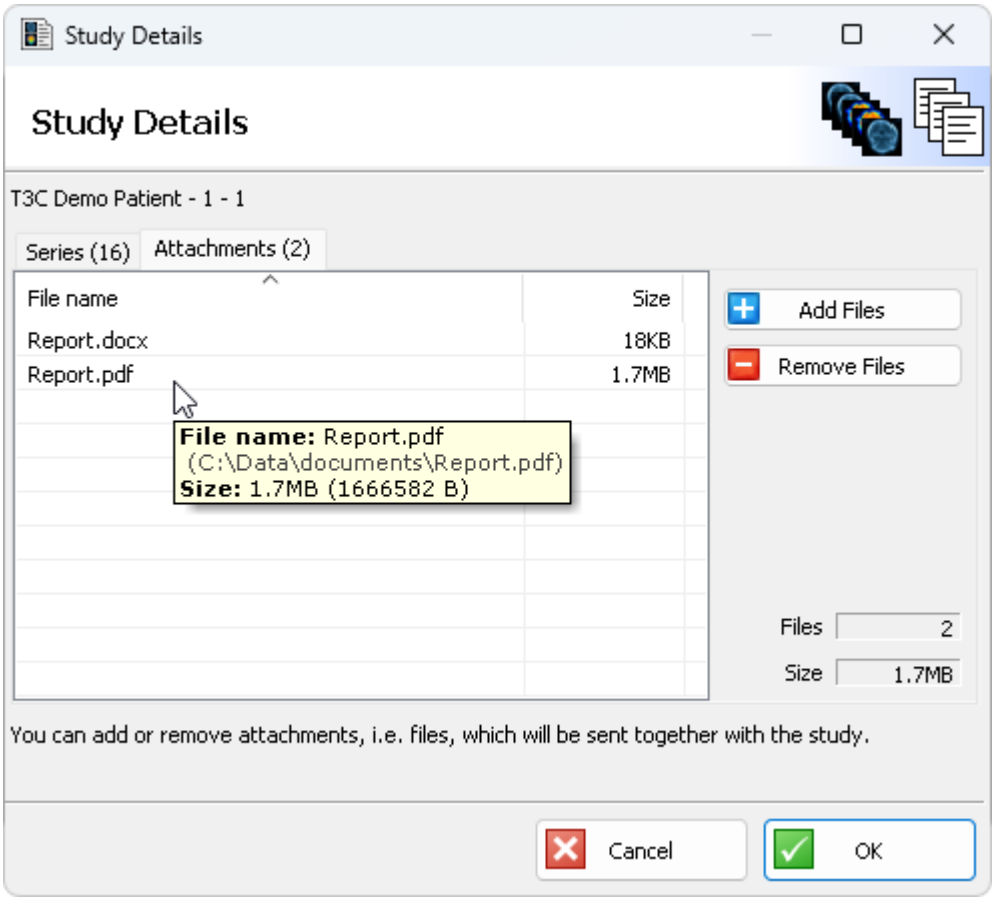

Figure 33 – Sending Wizard: choosing studies – study attachments

4. You have chosen studies and their attachments to be sent. Now you can select one or more *institutions*, which you want to send the studies to. All chosen studies with attachments will be sent to every selected *institution*. Please, see the chapter 3.6 Institutions to find more information how to work with the institution list Proceed to the last step (press **Next**).

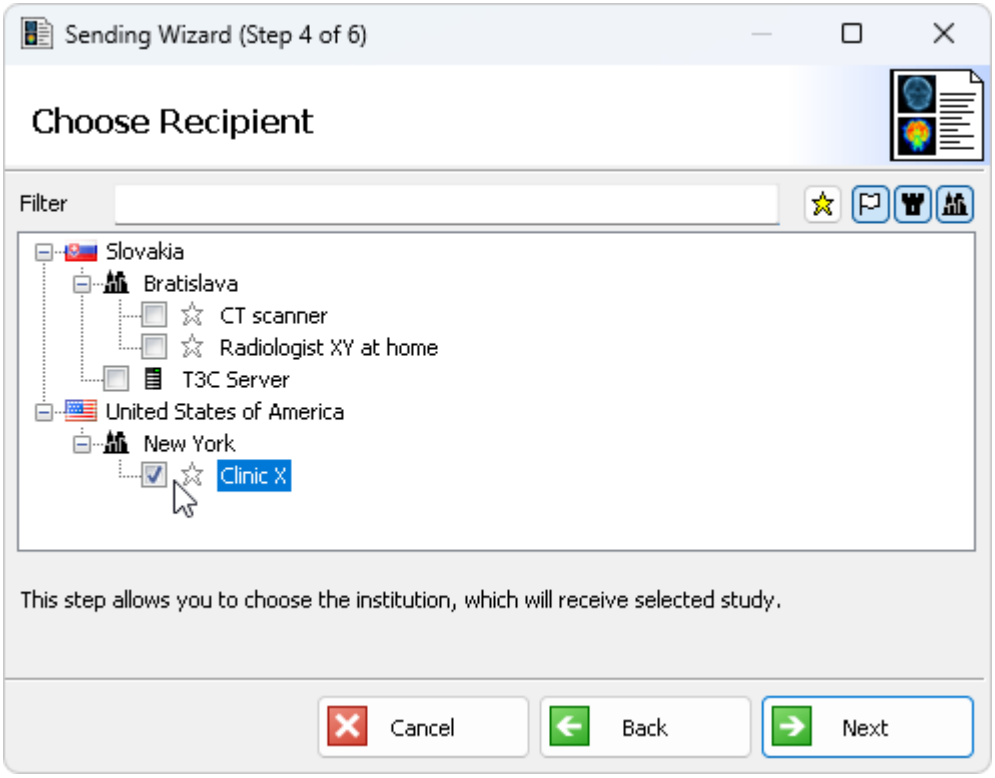

Figure 34 – Sending Wizard: selecting institutions, where studies will be sent to

5. Before sending of the studies you can edit Comment. It is shown in Inbox and Outbox study lists and makes navigation among studies easier. Comment is also suitable to fill in notes for recipients. If you select ☑ the option "Urgent", studies will be automatically assigned priority and marked with stars in recipient's Inbox.

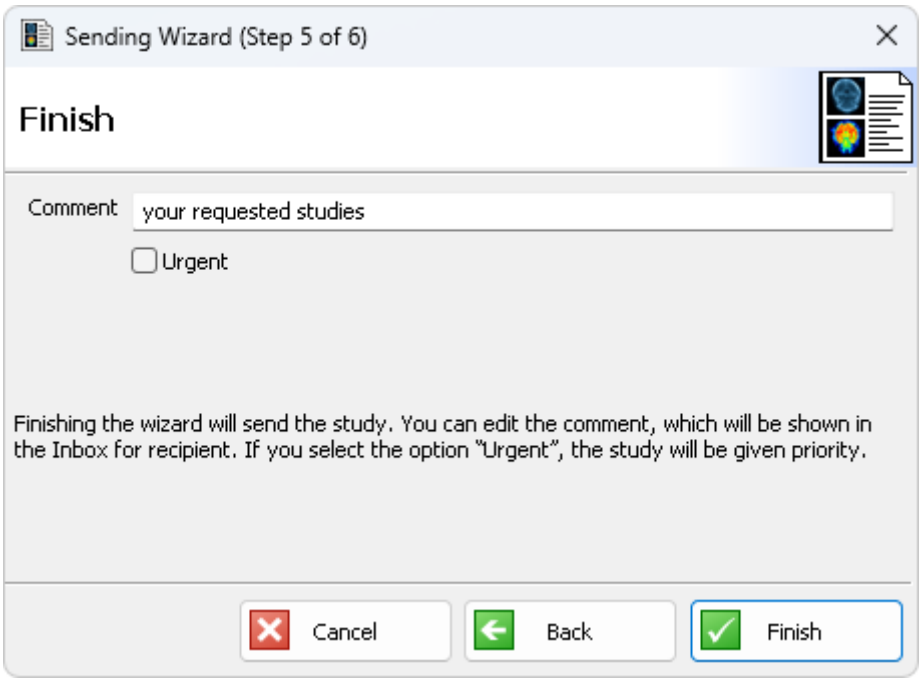

Figure 35 – Sending Wizard: Finishing

6. The last step of the Sending Wizard is displayed while the studies are being prepared for sending. You can track the progress there. You can safely hide the

wizard with the **Hide** button and the preparation will take place on the background. In that case, please do not close the Console, until the studies are prepared for sending.

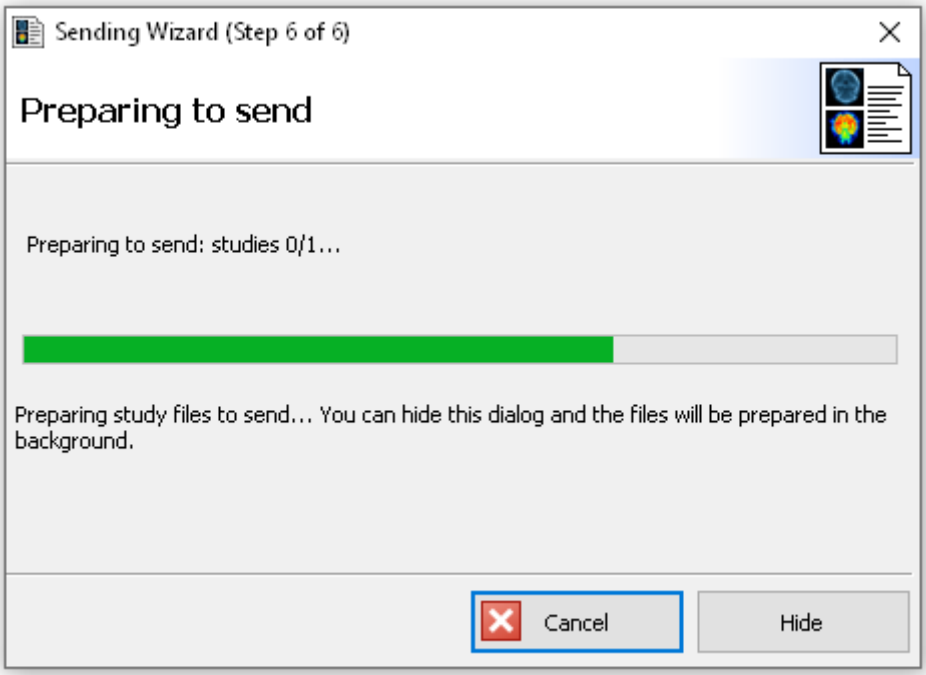

Figure 36 - Sending wizard: Preparing to send

4.1.2 Storing study

Downloaded studies having Transfer status "Downloaded" are shown in the Console Inbox list. Select the studies, which you want to store, and press the **Store** button. Storing study opens.

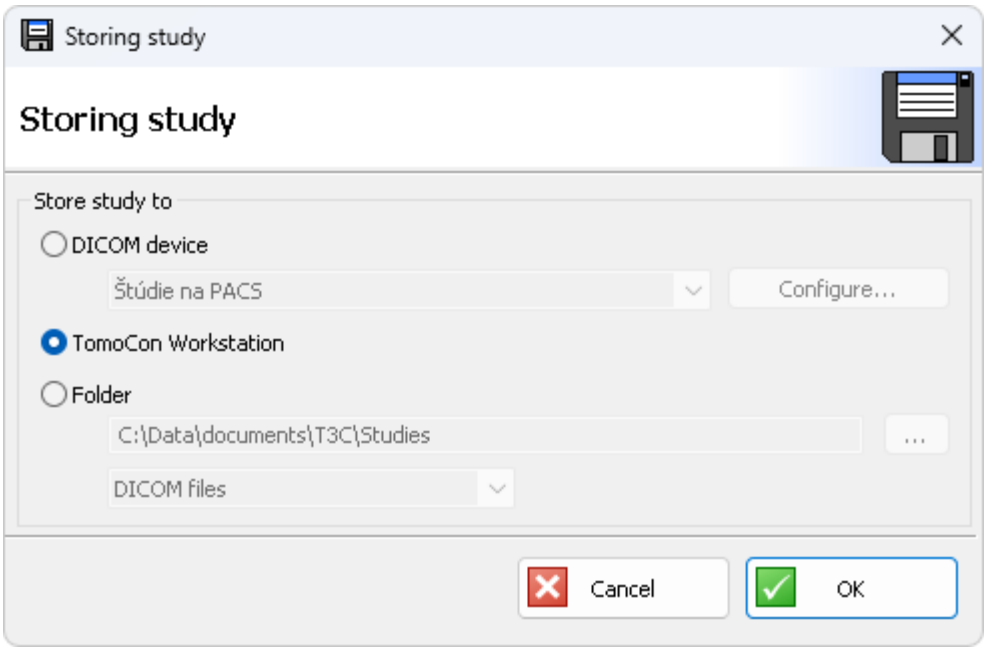

Figure 37 – Storing study: choosing the destination

Storing study allows you to choose where to store selected downloaded studies. Studies can be stored to:

- DICOM device (e.g. PACS),
- TomoCon Workstation,
- any local disk or network folder as DICOM files, DICOMDIR, or DICOMDIR with TomoCon Lite. (TomoCon Lite has to be enabled by the administrator of T3C Server.)

Press the **OK** button to start storing of the selected downloaded.

4.1.3 Opening study

Downloaded studies can be directly opened in TomoCon Workstation (if installed) or in TomoCon Lite (if enabled). Select the studies, which you want to open and press **Open** button.

4.1.4 Opening attachments

Downloaded studies may have attachments. This is indicated by paperclip icon in the Console Inbox list. Select the studies, which attachments you want to see, and press **Attachments** button. Console copies attachments to a temporary folder and opens the folder. Attachments are ready to use.

4.1.5 Reply study

Select one of the stored studies in the Console Inbox list and click the **Reply** toolbar button.

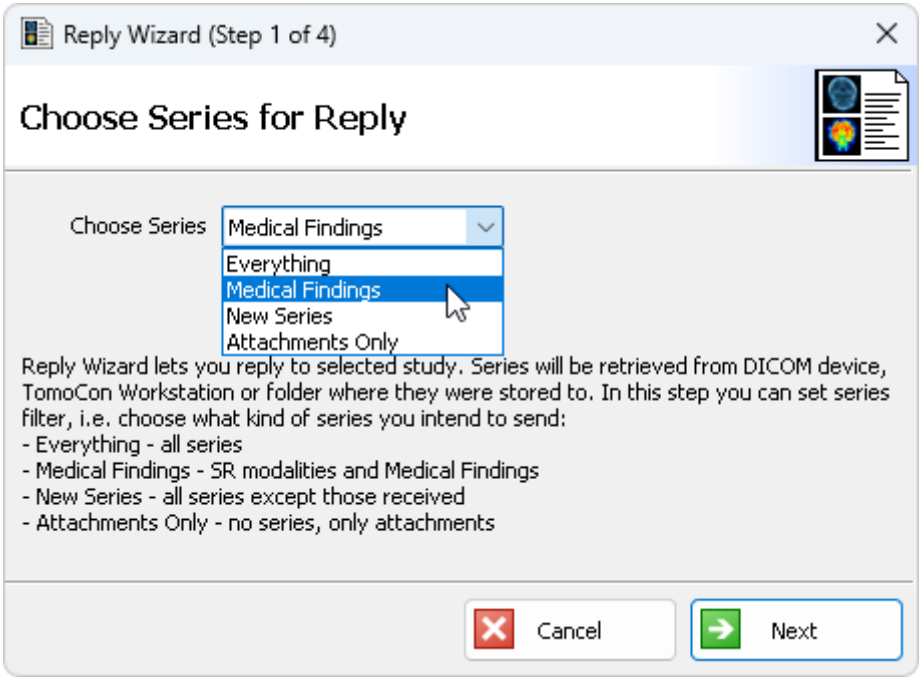

Figure 38 – Reply Wizard

1. Reply Wizard will be opened. Select your option:
   - Everything – all series
   - Medical Findings – series containing only annotations or structured reports
   - New Series – all series except those you are replying to
   - Attachments Only – no series, only attachments

2. If you want to adjust your series selection from the first step or add attachments, you can do it in the next step of the wizard. (For more details see the step 3 in the chapter 4.1.1 Sending study.)

   If no series were found, you could still add attachments to the study and follow the next step.

3. You can edit Comment shown in Inbox and Outbox study lists. Use the **Finish** button to start sending. (For more details see the step 5 in the chapter 4.1.1 Sending study.)

4.1.6 Deleting study

Sending of studies ends in the transfer status *Sent*. At that point, the studies are successfully transferred to Server. Sent studies can be deleted, because they will remain available for recipients on Server.

Receiving of studies ends in the transfer status *Stored*. At that point, the studies are successfully transferred from Server and stored. Stored studies can be deleted, because they will remain accessible from where they have been stored.

Warning: Study opened in TomoCon Lite is stored in a **temporary storage** and its status is changed to *Stored*.

Warning: In case of deleting the currently transferred studies, data transfer in progress is also canceled. If a recipient deletes studies, which are not *stored*, the studies will be no longer available to the recipient.

Select studies to delete and press the **Delete** button. You can keep track of past transfers in History Records (details in the chapter 3.7 History Records).

4.1.7 Sending text messages

Switch to the tab Messages and press the toolbar button **New Message**. The opened window allows you to choose a recipient and to enter your message. Use the **Send** button to send your message.

Sent messages are found in the Outbox folder and received messages are found in the Inbox folder (refer to the chapter 3.4 Messages).

4.1.8 Sending requests

Switch to the tab Messages and press the toolbar button **New Request**. The opened window allows you to choose a recipient and to fill in your request for an examination or images. Enter patient and study details, which can be directly used by the recipient while searching images in PACS, DICOM devices or TomoCon Workstation. Enter your note for the recipient to the text area at the bottom. Use the **Send** button to send your request.

Your requests waiting for replies are found in the Outbox folder and the view Sent Requests. Replies to your requests are found in the Inbox folder and the view Received Replies (refer to the chapter 3.4 Messages).

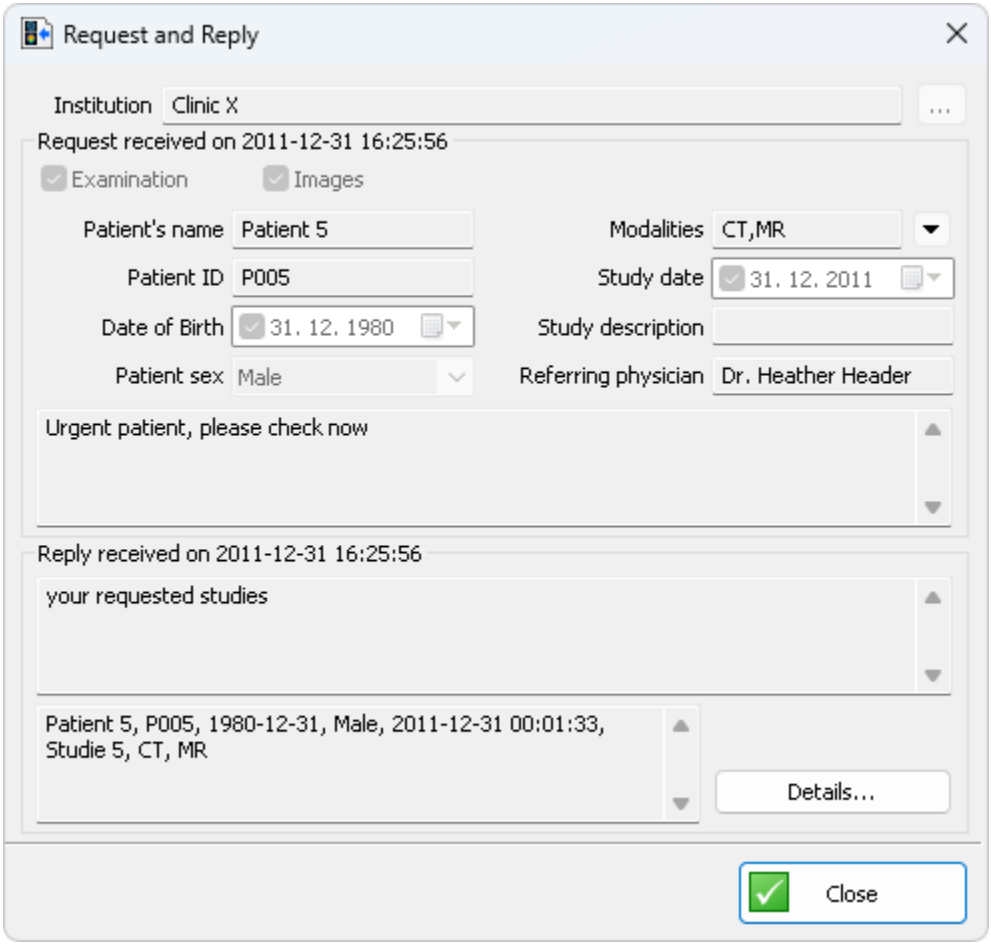

Figure 39 – Request and Reply

4.1.9 Replying to requests

Switch to the tab Messages. Requests, to which you have not replied, are found in the Inbox folder and the view Received Requests. Your replies to requests are found in the Outbox folder and the view Sent Replies (refer to the chapter 3.4 Messages).

Double-click on a received request to open the window with entries of the request and an empty form allows you to reply to the request.

Double-click on a received request to open the window that displays entries of the request and allows you to reply to the request using an empty form below. Every received request is digitally signed. A digital signature serves as proof that the particular request was created by the sender displayed at the top of the window.

The reply window area allows you to enter a note and offers the button **Send study** to open Sending Wizard (for more details see the chapter 4.1.1 Sending study):

1. Sending Wizard will be opened where you can select the source of studies for sending. When you search PACS, DICOM devices or TomoCon Workstation, entries of the request are filled in the search form by default.

2. If you want to adjust your series selection from the first step, double-click the study to open its series and attachments lists.

3. You can edit Comment shown in Inbox and Outbox study lists. Use the **Finish** button to start sending.

Sent study details will be attached to your reply to the request. Use the **Details** button to open a window that displays series details of the sent studies.

Use the **Reply** button to send your reply.

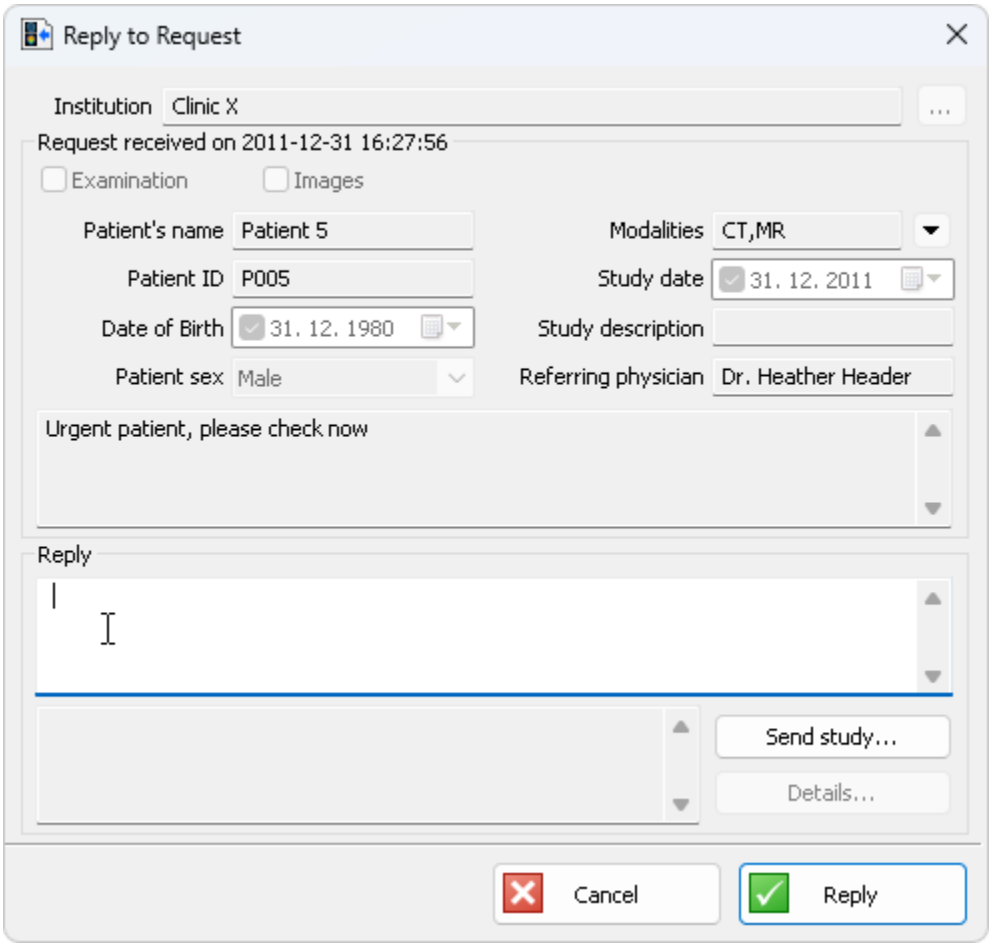

Figure 40 – Reply to Request

4.1.10 T3C Service activity check

Console displays a connection status in the status bar at the bottom of the Console window. If you hovers mouse cursor over the sign, a status message will be displayed as a tooltip. The following table explains meanings of status and status messages:

On-line	*Tooltip* – Connected to T3C Server *Explanation* – Connections to Service and Server are working properly.
On-line (receive only)	*Tooltip* – Connected to T3C Server but sending is disabled *Explanation* – Connections to Service and Server are working properly, but sending is disabled.
Server unreachable	*Tooltip* – T3C Server is unreachable, please check your Internet connection *Explanation* – Connection to Service is working properly, but Server is temporarily unreachable. If you are experiencing internet connection problems, contact your network administrator or internet provider.
Downgraded installation	*Tooltip* – This installation is downgraded, minimum version required is <version number> *Explanation* – Connections to Server is working properly but Service is obsolete, version <version number> is required. Update T3C in your institution to the latest version.
Service unreachable	*Tooltip* – T3C Service is unreachable, please check if it is running *Explanation* – Connection to Service is not available when Service is starting or not running. Another reason can be the unavailability of network connection on system level (e.g. firewall, antivirus software, system settings).
Incompatible Service	*Tooltip* – Connected to incompatible T3C Service <service-version> *Explanation* – Connection to Service can be established, but Console and Service are not compatible and therefore cannot communicate with each other. You need to update your Console and/or Service to versions that are compatible.

When you click the connection status, you can start connection diagnostics. Please, use it to troubleshoot connection problems.

Note: Service is running as Windows service, thus, you can start/stop/restart it as other services.

4.1.11 Institution registration activation

Important: T3C system administrator will prepare your institution's registration and provide you with data for activation.

At the end of the first installation, the registration activation wizard is started automatically.

1. The Private key generation dialog opens, in which you can choose the complexity of the private key cipher in bits.

Note: Greater complexity of the cipher means greater security, but also longer time to create a private key and higher demands on computing resources during encryption.

2. In the next step, enter your institution ID and activation code. This information will be provided by T3C system administrator.

3. Once confirmed, the server will verify and activate institution registration. If there are connectivity issues during verification, a dialog will appear where you can enter the proxy server configuration (details in the chapter 4.1.12 Internet Settings).

4. After successful activation, you can start using the system immediately.

Important: After successful activation, please backup the created private key and basic configuration - pk.pem and main.conf files from the %PROGRAMDATA%\TatraMed Software\T3C\Service\conf folder. Without this data, you cannot restore your registration in the event of a failure of your computer.

4.1.12 Internet Settings

Important: Consult your network administrator to obtain the HTTP proxy server configuration details.

Choose one of the following options according to your network configuration:

- Direct connection (without Proxy Server)
- Automatically detect settings from Internet Explorer – Service will always use the current Microsoft Internet Explorer's proxy server configuration.

- Manual Proxy Server configuration – Fill the proxy server address (and port) in the Proxy Server field. (The fields User Name and Password are optional, depending on the configuration of the HTTP proxy server.)

4.2 Solving exceptional situations

If an exceptional situation occurs, Console shows a message box, which usually contains short instructions, what you can do next in the particular situation:

Situation – Console shows the message: "Please make sure you are connected to the T3C Service."
Solution – Connection to Service is not available, if Service is not in proper operation (see instructions in the chapter 4.1.10 T3C Service activity check). Another reason can be the unavailability of network connection on system level (e.g. firewall, antivirus software, system settings).

Situation – Console shows the message: "Please make sure you have installed TomoCon Workstation properly."
Solution – Check, if TomoCon Workstation is installed properly and reinstall if needed.

Situation – Console shows the message: "Please make sure the DICOM Device is configured properly and is accessible."
Solution – Check the DICOM device configuration in the DICOM Devices settings a use the **Verify** button to check if the connection to the device is available (see the chapter 3.9.1 System).

Situation – Console shows the message: "No images were found for Series in Study on DICOM device.
Situation – Console shows the message: "No series were found for Study on DICOM device."
Situation – Console shows the message: "DICOM device has been contacted successfully, but studies could not be retrieved."
Solution – Images, several series or entire studies were not received from the DICOM device, however, the device has been contacted successfully. This may occur, if your user rights are not sufficient to access the images or if image data format is not supported. The images, which are not received by Console, are not sent to Server, but all received images are sent. Another possible reason can be a restrictive firewall, incorrect configuration of the DICOM device, or incorrect Console configuration for the DICOM device.

Situation – The Console version is incompatible with the Service version.
Solution – Console has attempted to connect to Service of different version. It is not safe to connect and work with a different version of Service. Thus Console refuses the connection. Please upgrade your installations or modify your Console System settings to connect to another Service (see the chapter 3.9.1 System).

Situation – Could not find the application manual. Console shows the message: "Please, check if the documentation was installed and try to reinstall it."
Solution – When the documentation file is not located in the application folder of TomoCon Communication Center, then the manual can be additionally installed. Launch the installation again and select installation of the documentation. (Follow instructions in the chapter 2.2 Installation.)

5 Contact

If you have any questions or comments, please contact our customer support:

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